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# LAUNCHING THE ROCKET INDUSTRY IN THE UNITED STATES: DOMESTIC REGULATION OF PRIVATE EXPENDABLE LAUNCH VEHICLES

By  
ALLEN DUANE WEBBER\*

ON SEPTEMBER 9, 1982, Space Services Incorporated of America (SSI) became the first American company to launch a rocket into space.<sup>1</sup> Using its own launching facilities located on Matagorda Island, Texas, SSI sent the Conestoga I into a sub-orbital flight that officially launched the development of a new American industry—Expendable Launch Vehicles (ELV's).<sup>2</sup> The success of the

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<sup>1</sup> See SPACE SERVICES INC. OF AMERICA, CONESTOGA I MISSION REPORT 3 (March 9, 1983) (submitted to the FAA) [hereinafter cited as MISSION REPORT]. SSI's express objectives were to: (1) demonstrate SSI's ability to fund, organize and develop a completely private launch capability; (2) to develop a cooperative working relationship with the relevant federal agencies; (3) to acquire operational experience; (4) to develop a model private launch site; (5) to predict the success of orbital operations based on sub-orbital performance; and (6) to compare the performance of Conestoga I to the design mission. *Id.* at 3. SSI accomplished each of these objectives. *Id.* at 1.

The Conestoga was not SSI's first attempt to launch a space vehicle. In 1981, SSI planned to launch the Percheron I but failed when the engine exploded in a test fire.

<sup>2</sup> See MISSION REPORT, *supra* note 1, at 1-5 (discussing objectives, structure, and performance of the Conestoga launch).

Although private enterprise has long been in the business of manufacturing ELV's, only NASA had launched such a vehicle in the United States prior to the Conestoga I flight. Four companies manufacture successfully used expendable launch vehicles: Martin Marietta (Titan, used primarily by the Defense Department); McDonnell Douglas (Delta, used by NASA); General Dynamics (Atlas, used by NASA and the Defense Department); and LTV Aerospace (Scout, used by

Conestoga launch demonstrates that private enterprise can organize, fund, and conduct commercial rocket launches using private facilities, without government subsidization.<sup>3</sup> SSI plans to launch the Conestoga II in 1984 or 1985 to place a commercial satellite into low earth orbit.<sup>4</sup>

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NASA). CONGRESSIONAL RESEARCH SERVICE, LIBRARY OF CONGRESS, 98TH CONG., 1ST SESS., POLICY AND LEGAL ISSUES INVOLVED IN THE COMMERCIALIZATION OF SPACE 46 (Comm. Print 1983) [hereinafter cited as Committee Print]. At least three of these companies have considered developing launch capability. *Id.*

<sup>3</sup> Although SSI used a Minuteman I motor provided by NASA to propel the Conestoga, it purchased the unit and did not receive any free service in the installation of the booster. See MISSION REPORT, *supra* note 1, at 3, 6; *Space Commercialization Hearings Before the Subcomm. on Space Science and Applications of the House Comm. on Science and Technology*, 98th Cong., 1st Sess. 65 (1983) (statement of David Hannah, Jr., Chairman of the Board, Space Services of America) (NASA provided SSI with the rocket motor for use in the Conestoga) [hereinafter cited as *Commercialization Hearings*]. The purchase of the rocket engine received the approval of numerous NASA officials as well as representatives of the House and Senate. Letter from James V. Carroll to John H. Cassady, FAA, July 15, 1982 [hereinafter cited as Supplement Letter].

Other business ventures, however, have considered and proposed joint ventures with NASA. Arguably, NASA should not engage in such activities, as it is a research and development agency, not a quasi-corporation that seeks a profit like Commercial Satellite Corporation ("COMSAT"). See generally *Commercialization Hearings, supra*, at 61 (statement of Hannah) (discussing NASA's role in commercialization); see Butler, Heritage Foundation Executive Memorandum, April 11, 1983, *reprinted in* 129 CONG. REC. E1599, E1600 (daily ed. April 14, 1983) (NASA Charter limits activities to research and development, not operations; legitimate mission is to advance research and develop knowledge base). Indeed the SSI acquisition of a booster was not actually a commercial "purchase," at least not in the strict sense of the word. At all times the motor technically belonged to NASA—SSI simply had the right to use the rocket engine for a launch. Because the booster was useless after the launch, SSI had to compensate NASA for the "damage" caused by its use. This creative approach to the "sale" avoided the otherwise difficult procedure of procurement from a government agency.

Most agree that the government should not subsidize the private ELV industry. See *Commercialization Hearings, supra*, at 150 (statement of Herbert A. Reynolds, Deputy Director, Intelligence and Space Policy; Deputy Under-Secretary of Defense, Policy) (interagency group agrees United States should not subsidize industry); *id.* at 213 (statement of Dr. Klaus Heiss, former President, The Space Transportation Co., Inc.) (government subsidization not required for commercial ELV's).

In addition, most agree that special tax considerations are *not* necessary to stimulate private industry in space. See *id.* at 18 (statement of Mitchell Rogovine) (space industry no different from other American industries with respect to tax); *id.* at 72-73 (statement of Hannah) (commercial operations need no special tax incentive).

<sup>4</sup> *Commercialization Hearings, supra* note 3, at 64 (statement of Hannah).

Another company, Starstruck, on February 6, 1984, attempted to become the second private enterprise to put a rocket into sub-orbital flight.<sup>5</sup> Starstruck intended to launch the Dolphin, a privately developed ELV, into space from a platform in international waters off the coast of California but was thwarted by a small engine fire.<sup>6</sup> The company again attempted to launch the Dolphin on March 31, 1984.<sup>7</sup> Although this attempt was aborted when a water leak shorted out the rocket's electrical system, Starstruck plans to continue its launch efforts.<sup>8</sup>

Other private firms or joint ventures are developing expendable vehicle launch capability and are actively pursuing clients and a position in the marketplace.<sup>9</sup> Several companies have developed upper stage vehicles designed to place payloads in high orbit.<sup>10</sup> Other private groups are devising new technologies, including launches of reusable manned vehicles from modified 747's and single stage manned rockets that could transport payloads to high

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<sup>5</sup> Starstruck had obtained the necessary approvals and was scheduled to launch from its ocean platform on February 6, 1984. The company threw the rocket overboard, however, when nitrogen leaked and a fire developed. *Dolphin at Sea, Private Launcher Catches Fire, Thrown Overboard*, Satellite Week, Feb. 20, 1984, 6 [hereinafter cited as *Dolphin Launch*]. Starstruck formerly was known as ARC Technology.

<sup>6</sup> *Id.* The fire occurred when workers attempted to repair a nitrogen leak that apparently resulted from the land transport of the space vehicle to its port of departure. *Id.* The workers threw the rocket into the ocean to put out the fire and then retrieved it for reconditioning. *Id.*

<sup>7</sup> *Starstruck to Continue Dolphin Tests*, J. COM., Apr. 11, 1984, at 2a.

<sup>8</sup> *Id.*

<sup>9</sup> See also *Commercialization Hearings*, *supra* note 3, at 232 (statement of James C. Bennett, Vice President for Government Affairs, ARC Technologies) (discussing launch plans). See generally Committee Print, *supra* note 2, at 45-52. (discussing private space ventures). Three producers of ELV's are actively marketing their wares, while a fourth manufacturer has the same potential. See *id.* at 46-47; see also note 2 *supra* (describing existing ELV's). In addition to the Conestoga and the Dolphin, a third corporation, Satellite Propulsion, Inc., is independently developing its own ELV, the Liberty. Committee Print, *supra* note 2, at 47. Consequently, there are no fewer than seven companies that are potential competitors in the ELV industry.

<sup>10</sup> Both McDonnell Douglas and General Dynamics currently manufacture upper stage vehicles called the Payload Assist Module and the Centaur, respectively. Committee Print, *supra* note 2, at 47. Two other companies, Boeing and Orbital Systems Corp., are currently developing similar upper stage vehicles. *Id.*

orbits and even to the moon.<sup>11</sup> Finally, at least two firms have entered into negotiations to buy and operate a fifth space shuttle.<sup>12</sup>

Thus, there is little doubt that private enterprise is ready and willing to leap into the space transportation business—an industry with a potential market of \$10 billion over the next ten years.<sup>13</sup> As with most technologies on the horizon, however, private launch corporations face a potential brick wall—government regulation.<sup>14</sup> Prior to the Conestoga, all launches from the United States were conducted by NASA, which operates under its own rulings and guidelines.<sup>15</sup> Consequently, there are no

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<sup>11</sup> See *id.* at 48-49 (discussing plans of Transpace Inc. to offer to Space Van and of Pacific American Launch Systems to develop the Phoenix). For those who think that the idea of private enterprise going to the moon is overly ambitious or absurd, the dramatic growth of the airline industry in the 1920's and 1930's despite similar doubts should serve as convincing proof of the ability of American businesses to apply existing technology to serve commercial interests. In this context, one commentator has argued that the "history of air travel and telecommunications demonstrates clearly that the private sector will enter the most sophisticated fields and bring services to the public that had been unimaginable a few years earlier. America's future in space will be no different . . . ." Butler, *supra* note 3, at E1600. Moreover, it is likely that the organizers of the Conestoga launch initially encountered many disbelievers who charged that private launches would not occur in this century. On the contrary, a viable ELV industry now exists and is realistically planning to expand to reusable, long flight rockets.

<sup>12</sup> See *Private Shuttle Operation "Not Realistic" Says Heiss*, J. COM., June 11, 1984, at 2a. Astrotech International Corp. recently proposed to buy the fifth shuttle for \$2 billion. *Id.* Space Transportation Co., partially owned by Prudential Insurance and Federal Express, offered to purchase a fifth shuttle in 1982, and negotiations with NASA were still underway as of May, 1983. See Committee Print, *supra* note 2, at 51; *Commercialization Hearings*, *supra* note 3, at 128-29 (statement of Lt. General James A. Abrahamson, Associate Administrator for Space Flight, NASA) (discussing status of negotiations between NASA and Space Transportation Co.).

<sup>13</sup> See *Commercialization Hearings*, *supra* note 3, at 202 (statement of Allan McArtor, President and Chief Operating Officer of Space Transportation Co., Inc.); Murdock, *Certification of Aircraft and Aerospace Vehicles*, FIRST ABA FORUM ON AIR AND SPACE LAW, at 12 (1984).

<sup>14</sup> See *Commercialization Hearings*, *supra* note 3, at 179, 180 (statement of Gary Flora, Director of Commercial Titan at Martin Marietta) (government authorization stands in way of commercialization of space as a whole, including Titan: government approval most important right now); Butler, *supra* note 3, at E1599 (asserting there is danger that "federal government will suffocate space entrepreneurs with red tape . . .").

<sup>15</sup> See 42 U.S.C. §§ 2451-2484 (1976 & Supp. V 1981); 14 C.F.R. §§ 1201-1202 (1983).

There is little concern that the entry of private enterprise into the space payload

regulations specifically designed to apply to private launches and no single central agency to promulgate regulations.<sup>16</sup> Rather, various government agencies with relevant interests to protect have interjected a hodgepodge of uncoordinated licenses and legal requirements that make private launchings a procedural nightmare.<sup>17</sup>

## I. UNITED STATES POLICY ON PRIVATE ELV LAUNCHES

An unstructured regulatory system exists despite the official national space policy, supporting, *inter alia*, the expansion of the "private-sector investment and involvement in civil space and space related activities."<sup>18</sup>

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delivery market will conflict with the operation of NASA's space shuttle program. Private expendable vehicle launches will not compete with the shuttle. *See Commercialization Hearings*, *supra* note 3, at 22 (statement of Philip M. Klutznick, Chairman, National Academy of Public Administration Panel on Encouraging Business Ventures in Space Technologies) (NASA phasing out ELV's; private ELV's will compete with Ariane, not shuttle); *id.* at 37-38 (statement of James M. Beggs, Administrator, NASA) (shuttle will capture most of market in long term). *But see id.* at 87 (Ordahl, Director of Space Programs, McDonnell Douglas Astronautics) (suggesting ELV's will compete with shuttle). Rather the private ELV industry will complement and supplement the shuttle fleet. *See Commercialization Hearings*, *supra* note 3, at 64, 75 (statement of Hannah); *id.* at 130 (statement of Abrahamson); *id.* at 174-75 (statement of Flora). Private ELV's will offer not an alternative but an overflow or backup capacity in cases in which a shuttle launch is delayed for technical or other reasons, or in periods of high demand. Indeed, the participation of private enterprise in space activities is crucial to the continued lead of the United States in space. *Id.* at 4 (statement of Klutznick).

<sup>16</sup> *See* Myers, *Federal Government Regulation of Commercial Operations Using Expendable Launch Vehicles*, FIRST ABA FORUM ON AIR AND SPACE LAW, at 2 (1984) (no single regulatory agency or comprehensive framework governing private space activities); *see infra* notes 39-112 and accompanying text (discussing various agencies with regulatory concerns).

<sup>17</sup> *See Commercialization Hearings*, *supra* note 3, at 48 (statement of Beggs) (regulatory process is "chaotic"); Murdock, *supra* note 13, at 12 (referring to existing "neanderthal regulatory approach"); Myers, *supra* note 16, at 2 (many agencies and institutions influence approvals process; adverse decisions from any of these has potential for halting any rocket launch); 128 CONG. REC. E5376 (daily ed. Dec. 21, 1982) (statement of Rep. Akaka) (approval process "complicated"; requires "inordinate amount of time and money"). This article addresses the more significant licenses and legal requirements imposed by federal agencies. *See infra* notes 39-112 and accompanying text (discussing significant participants in the regulatory non-structure).

<sup>18</sup> United States Space Policy, Administration of President Reagan, 18 WEEKLY COMP. PRES. DOC. 872 (July 4, 1982) (Presidential Directive/NSC-42). On October 31, 1984, as this article was going to print, the President signed legislation

In 1982, the President announced that the United States would encourage domestic commercial exploitation of space but indicated that such activities "must be consistent with national security concerns, treaties, and international agreements."<sup>19</sup> Thus, the government announced that it would authorize and regulate private space activities to the extent required by treaty and by national security.<sup>20</sup>

Beyond the original general policy statement, the government has evinced a willingness to limit the regulation of private launch vehicles to that required "to meet . . . national and international obligations and to ensure public safety."<sup>21</sup> Moreover, the government fully supports the commercialization of ELV's and will encourage the use of government launch ranges by private enterprise.<sup>22</sup> Although the United States will not subsidize the industry, it will price its facilities, services, and equipment with the policy of expansion in mind.<sup>23</sup>

Such a minimal regulation policy is crucial to the development of an infant industry like expendable launch vehicles. If faced with excessive regulation or a burdensome licensing procedure, private enterprise would not take on the risks inherent in space transportation, and a potentially competitive and beneficial industry would be still-born.<sup>24</sup> Indeed, some maintain that the cumbersome

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designed to consolidate regulatory control over ELV's in the Department of Transportation. Although this article does not discuss the new law in depth, it does address the premature nature of the legislation. See *infra* note 229 (discussing H.R. 3942).

<sup>19</sup> *Id.* at 873.

<sup>20</sup> *Id.*

<sup>21</sup> Expendable Launch Vehicles, Announcement of United States Government Support for Commercial Operations by the Private Sector, Administration of President Reagan, 19 WEEKLY COMP. PRES. DOC. 721, 722 (May 16, 1983) [hereinafter cited as Policy Statement].

<sup>22</sup> *Id.* at 722.

<sup>23</sup> See *id.*

<sup>24</sup> See *Commercialization Hearings*, *supra* note 3, at 49 (statement of Beggs) (must not overburden industry with restrictions so that it fears entering the market; need assurance that substantial investment can go forward); Murdock, *supra* note 13, at 12 ("neanderthal" regulatory approach could stifle ELV industry).

approval process has already inhibited substantial investment in ELV's.<sup>25</sup> Moreover, the ELV industry is rapidly growing in other parts of the world, and the government must not stand in the way of private enterprise if the United States is to remain competitive in the launch services marketplace.<sup>26</sup>

To implement this prodevelopment policy, the President first established an inter-agency group, formed and co-chaired by NASA and the Department of State, to streamline existing licensing procedures, to develop and coordinate new licensing and regulatory procedures, to apply to routine launches from commercial ranges, and to recommend an appropriate lead agency.<sup>27</sup> After several months the President designated the Department of Transportation (DOT) as the lead agency with the responsibility of fostering commercial use of expendable launch vehicles.<sup>28</sup> The Secretary of Transportation indicated that the directive included the creation of a new office within the DOT to head an inter-agency task force on expendable launch vehicles.<sup>29</sup> Among the agencies that are participating in the regulatory process are the FCC, the State Department, the Coast Guard, the Federal Aviation Administration (FAA), NASA, the Department of Defense and the Commerce Department.<sup>30</sup> The DOT's role is not

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<sup>25</sup> See *Hearings Before the Subcomm. on Space Science and Applications of the House Comm. on Science and Technology*, 98th Cong., 1st Sess. 2 (1983) (statement of Elizabeth H. Dole, Secretary of Transportation) [hereinafter cited as *ELV Hearings*].

<sup>26</sup> China, India, Japan, and the European countries all have plans to launch vehicle services, and the Soviet Union has shown some interest in entering the market. *Commercialization Hearings*, *supra* note 3, at 103 (statement of Akaka); see *id.* at 108-11 (discussing space efforts of other countries).

<sup>27</sup> See *ELV Hearings*, *supra* note 25, at 3. The interagency group produced a series of three reports, only one of which the National Security Council would release. See REPORT ON U. S. GOVERNMENT ORGANIZATION AND PROCESS FOR HANDLING U.S. COMMERCIAL SPACE LAUNCH OPERATIONS, Sept. 15, 1983 [hereinafter cited as SIG REPORT].

<sup>28</sup> DOT Will Be Lead Agency for Expendable Launch Vehicles in Space, Department of Transportation News, DOT 98-83 (Nov. 17, 1983) [hereinafter cited as DOT Press Release].

<sup>29</sup> EXPENDABLE LAUNCH VEHICLES IN SPACE, DEPARTMENT OF TRANSPORTATION FACT SHEET (Nov. 17, 1983) [hereinafter cited as DOT FACT SHEET].

<sup>30</sup> DOT Press Release, *supra* note 28, at 2.



to add new regulations to the list already required but to "streamline government procedures applicable to private sector launch activities" and devise a "'one-stop shopping' system for launch approvals."<sup>31</sup> On February 14, 1984, the President signed an Executive Order that officially established the DOT as the lead agency for purposes of private launch regulation and set forth the particular functions that the Department is to serve.<sup>32</sup>

This article addresses the proper implementation of the existing free enterprise policy.<sup>33</sup> A review of the existing regulatory non-structure reveals that, although no agency or department has direct regulatory authority over all aspects of private rocket launches, many have interests to protect and thus assert jurisdiction using regulations promulgated for other purposes wholly unrelated to the launching of space vehicles. An in depth examination of the experiences of SSI and Starstruck in wading through the duplicative prerequisites to the private launch of a space vehicle demonstrates the need for a more coordinated regulatory process. This article, after establishing that need, analyzes the effect of international and domestic law on the regulation of private expendable launch vehicles.<sup>34</sup> The article then evaluates the various candidates for the lead agency position<sup>35</sup> and determines that a specialized space agency under the wing of the DOT could best lead the regulatory process.<sup>36</sup> Further, this article discusses the appropriate structure of the regulatory agency and the functions that the agency should perform with respect to the development of an expendable launch

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<sup>31</sup> DOT FACT SHEET, *supra* note 29, at 2.

<sup>32</sup> Exec. Order No. 12,465, 49 Fed. Reg. 7211 (1984) (on commercial expendable launch vehicle activities) [hereinafter cited as ELV Executive Order].

<sup>33</sup> See *supra* notes 18-26 and accompanying text (discussing free enterprise policy of the United States).

<sup>34</sup> See *infra* notes 203-258 and accompanying text (discussing effect of international and national law on regulation of private ELV's).

<sup>35</sup> See *infra* notes 259-283 and accompanying text (evaluating candidates for lead agency position).

<sup>36</sup> See *infra* note 262 and accompanying text (asserting DOT best choice for regulating ELV's).

vehicle industry in the United States.<sup>37</sup> Additionally, the article discusses the potentially conflicting need to protect the public from potential harm and the desire to encourage private industry by minimizing the regulation of private launches. Finally, the article outlines some of the substantive regulations and procedures appropriate for adoption by the space agency.<sup>38</sup>

## II. EXISTING REGULATORY NON-STRUCTURE

### A. Federal Aviation Administration Regulation

The FAA is the only agency to which Congress has delegated any direct jurisdiction over any aspect of private rocket launches. The Federal Aviation Act of 1958<sup>39</sup> authorizes the Secretary of Transportation to issue, through the FAA, rules and regulations "[f]or the prevention of collision[s] between aircraft . . . and airborne objects."<sup>40</sup> The statute does not explicitly mention spacecraft or rockets. Nonetheless, the legislative history of the FAA statute clearly indicates that Congress intended to subject launch vehicles to FAA jurisdiction, at least to some extent.<sup>41</sup> Moreover, although the Act does not distinguish between spacecraft and aircraft, the FAA has recognized

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<sup>37</sup> See *infra* notes 284-312 and accompanying text (discussing appropriate ELV regulatory structures and functions).

<sup>38</sup> See *infra* notes 313-352 and accompanying text (discussing particular regulations and procedures appropriate for ELV regulatory authority).

<sup>39</sup> 49 U.S.C. §§ 1301-1523 (1982).

<sup>40</sup> *Id.* § 1348(c).

<sup>41</sup> See Murdock, *supra* note 13, at 12-13. Commenting on the scope of the FAA's jurisdiction, the Senate Committee explained that:

[i]n order for the administrator of the new agency to properly discharge his responsibilities under the new act, particularly those in connection with the allocation of airspace, that his jurisdiction should extend not only to vehicles commonly considered as aircraft, but also during their flight through airspace, other vehicles such as *rockets, missiles and other airborne objects*.

S. REP. NO. 1811, 85th Cong., 2d Sess. 20 (1958) (emphasis added). In this regard Congress broadened section 101(5) of the Act, 49 U.S.C. § 1301(5) (1976 & Supp. V 1980), "since all vehicles, rockets and missiles, as well as aircraft, are in fact used at least in part for navigation of the airspace." S. REP. NO. 1811, 85th Cong., 2d Sess. 20 (1958) (emphasis added). The FAA does not have jurisdiction over ELV's used by NASA or by the Department of Defense because Congress ex-

this distinction and has addressed the flight of rockets through airspace in its rules and regulations.<sup>42</sup> The FAA's exemption of the Space Transportation System (shuttle) from the coverage of the Act is further evidence of the FAA's understanding of the difference between aircraft and spacecraft.<sup>43</sup>

The FAA regulations (FAR's) define a rocket as "an aircraft propelled by ejected expanding gases generated in the engine from self-contained propellants and not dependent on the intake of outside substances."<sup>44</sup> The definition also includes any part of an aircraft that becomes separated from the vehicle during its operation.<sup>45</sup> The regulations provide that no person may operate such an unmanned rocket unless the operator gives certain safety related information to the nearest FAA Air Traffic Control facility within twenty-four to forty-eight hours prior to the launch.<sup>46</sup> The FAR's also provide that no person may operate an unmanned rocket:

- (a) in a manner that creates a collision hazard with other aircraft;
- (b) in controlled air space;
- (c) within five miles of the boundary of any airport;
- (d) at any altitude where clouds or obscuring phenomena of more than five-tenths coverage prevails;

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empted public aircraft from the FAA's regulatory powers. See *Murdock*, *supra* note 13, at 13.

<sup>42</sup> Dula, *Regulation of Private Commercial Space Activities*, PROCEEDINGS OF THE TWENTY-FOURTH COLOQUIUM ON THE LAW OF OUTER SPACE 25, at 25 (1981).

<sup>43</sup> Mossinghoff & Sloup, *Legal Issues Inherent in Space Shuttle Operations*, 6 J. SPACE L. 47, 65-66 (1978).

<sup>44</sup> 14 C.F.R. § 1.1 (1984).

<sup>45</sup> *Id.*

<sup>46</sup> *Id.* § 101.25. The required data includes:

- (a) the names and addresses of the operators;
- (b) the number of rockets to be operated;
- (c) the size and weight of each rocket;
- (d) the maximum altitude to which each rocket will be operated;
- (e) the location of the operation;
- (f) the date, time, and duration of the operation;
- (g) any other pertinent information required by the air traffic control facility.

*Id.*

- (e) at any altitude where the horizontal visibility is less than five miles;
- (f) into any cloud;
- (g) within 1,500 feet of any person or property that is not associated with the operation;
- (h) between sunset and sunrise.<sup>47</sup>

Although these regulations are purportedly aimed at rockets, they were not established with private commercial launches in mind.<sup>48</sup> Rather, the FAA prescribed the regulations "primarily for model rocket enthusiasts."<sup>49</sup> Because the FAA rules were not tailored to the concerns of expendable vehicle launches, no meaningful FAA regulations exist to control such launches.<sup>50</sup> Moreover, although the FAA generally requires aircraft registration and air-worthiness certificates for aircraft and aircraft engines,<sup>51</sup> no similar regulations with respect to unmanned rockets exist.<sup>52</sup> The FAA has thus recognized that FAR Part 101, Subpart C,<sup>53</sup> albeit insufficient, constitutes the only FAA regulation that applies to private expendable

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<sup>47</sup> *Id.* at § 101.23.

<sup>48</sup> The limitations imposed by section 101.23 were proposed in 1962, 27 Fed. Reg. 5402 (1962), enacted in 1963, 28 Fed. Reg. 306 (1963), recodified in 1963, 28 Fed. Reg. 6722 (1963), and amended in 1974, 39 Fed. Reg. 22, 252 (1974). Consequently, at the time it enacted the regulations, the FAA did not even contemplate the possibility of private commercial launches by a private ELV industry. See Petition of Space Services, Inc., For Exemption Before the Federal Aviation Administration, Docket No. 22,775 (March 16, 1982), at 9-10 (summary notice in 47 Fed. Reg. 16,243 (1982)) [hereinafter cited as Petition].

<sup>49</sup> Memorandum Re Contacts with the FAA from Arthur M. Dula to David Ross (July 17, 1981), at 3 [hereinafter cited as FAA Contact Memo]. The FAA explicitly indicated that it proposed the regulations governing unmanned rockets to regulate the "steadily increasing" activity in "experimental amateur rocketry." 27 Fed. Reg. 5402, 5403 (1962). The FAA apparently distinguished between "model rockets" and "experimental amateur rocketry." *Id.*

<sup>50</sup> See Memorandum Re Exemption from FAA Regulations from James R. Myers to Space Services Government Regulation File (Aug. 28, 1981), at 2 [hereinafter cited as FAA Regulation Memo] (FAA regulations cumbersome and ill-suited to regulate ELV's).

<sup>51</sup> See 14 C.F.R. §§ 21-39, 47 (1984).

<sup>52</sup> FAA Regulation Memo, *supra* note 50, at 1; see Murdock, *supra* note 13, at 13 (FAA declined to require that Conestoga I be certificated, registered, or otherwise controlled).

<sup>53</sup> 14 C.F.R. §§ 101.21-.25 (1984).

vehicle launches.<sup>54</sup>

In any event, to obtain the FAA's clearance for a launch, a company must secure either a waiver of, or an exemption from the regulations.<sup>55</sup> A waiver permits a company to conduct a one-time test-flight from the specified launch facility.<sup>56</sup> An exemption, on the other hand, represents a determination by the FAA that the proposed activity is not governed by the FAA regulations.<sup>57</sup> An exemption is thus much broader than a waiver and is preferable when the company plans to conduct more than one flight from a particular facility.<sup>58</sup> Moreover, the FAA has indicated that an exemption, rather than a waiver, will be required when the rocket will fly into controlled airspace or outside of United States territory.<sup>59</sup> Rocket launches from govern-

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<sup>54</sup> See Petition, *supra* note 48, at 8 (informal conversations with FAA suggest FAA regards Part 101, Subpart C as exclusive FAR's governing unmanned rocket); Mission Report, *supra* note 1, at 6; Myers, *supra* note 16, at 3. Because the FAA did not mention any other regulations when it exempted the Conestoga I launch, the FAA apparently determined that no other FAA regulations were applicable to private launches. In re Space Services, Inc., Regulating Doc. No. 227775 (September 1, 1982).

Because the FAA requires notice of construction, alteration, and activation of airports, 14 C.F.R. § 157 (1984), and a launch site could be considered an airport under the FAR's, see 14 C.F.R. § 1.1 (1984), it is possible that the FAA might regulate launch sites like airports. Apparently the FAA has not adopted this view.

<sup>55</sup> See FAA Contact Memo, *supra* note 49, at 1 (SSI must obtain either waiver or exemption if Percheron enters controlled airspace). Because a rocket is almost certain to enter controlled airspace, roughly 14,500 feet in altitude, all private launches will require either a waiver or an exemption of some kind. *Id.* at 2 (Percheron almost certain to fly into controlled airspace); Myers, *supra* note 16, at 4 (sub-orbital or orbital rocket launched from United States invariably enters controlled airspace requiring waiver or exemption).

<sup>56</sup> FAA Contact Memo, *supra* note 49, at 2. It appears that a company may obtain a waiver from a regional FAA office as long as the flight will not go beyond the territorial waters of the United States. *Id.* Otherwise, the waiver would have to be processed in Washington, D.C. because the State Department must review a launch plan that goes beyond the United States territorial waters before the FAA may grant a waiver. *Id.*

<sup>57</sup> *Id.* at 3. An exemption can only be granted in Washington, D.C. and the FAA must consult with and obtain comments from the Department of Defense, the Department of State, and any other agencies that have a jurisdictional interest in or use the air space. *Id.* at 2.

<sup>58</sup> *Id.* at 2 (exemption desirable if more than one launch planned from same or different site).

<sup>59</sup> See Petition, *supra* note 48, at 10 (should file for exemption if launch extends outside United States territory or above 14,500 feet).

ment facilities, however, do not require a waiver of, or an exemption from the FAA regulations because the airspace above government rocket ranges is restricted.<sup>60</sup> Rather, such launches are subject to the jurisdiction of the government agency that operates the range.<sup>61</sup>

B. *Interests of the Department of State in Private ELV's*

Although the State Department has no direct regulatory authority over private rocket launches, it has certain interests to protect. First, the Department of State, as the agency of the executive branch charged with handling foreign affairs, must ensure that the United States complies with its various international obligations.<sup>62</sup> As discussed below, the space treaties make the launching state responsible under international law for private space activities of its nationals and liable for any accidents caused by its launch vehicles.<sup>63</sup> Consequently, the State Department must review proposed private launches to prevent potential United States liability to foreign countries and to ensure launch safety. In this regard, the Department of State may require the launching company to obtain insurance or otherwise agree to indemnify the United States for any liability resulting from its treaty obligations.<sup>64</sup>

The Department of State is also concerned with launches that involve an "export" under the Arms Export

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<sup>60</sup> See 14 C.F.R. §§ 73.11-.19, 73.81-.85 (1984).

<sup>61</sup> See Myers, *supra* note 16, at 4, 6-7; *infra* notes 96-100 and accompanying text (NASA has jurisdiction when private company uses NASA facilities); *infra* note 104 and accompanying text (Department of Defense has jurisdiction over launches from its facilities).

<sup>62</sup> See Committee Print, *supra* note 2, at 20 (Department of State ultimately in charge of adherence to treaty obligations); see also Myers, *supra* note 16, at 7 (State Department responsible for negotiating, executing, and ensuring compliance with treaties).

<sup>63</sup> See *infra* notes 203-221 and accompanying text (discussing international treaty obligations of United States).

<sup>64</sup> Each of the private companies which launched a rocket obtained such insurance at the request of the Department of State. See *infra* note 182 and accompanying text (discussing SSI's launch insurance); see also *infra* note 195 and accompanying text (discussing Starstruck's launch insurance requirement).

Control Act.<sup>65</sup> The State Department designates certain defense articles, services, and technical data that may be exported from the United States only with a license issued under the Act and its accompanying regulations.<sup>66</sup> Included on this "Munitions List" are rockets, launch vehicles, payloads, specifically designated associated equipment, and related technical data.<sup>67</sup> In addition, the term export refers to "the sending or taking out of the United States in any manner any article, equipment or technical data on the Munitions List."<sup>68</sup> Therefore, whenever a rocket launched from United States territory travels beyond the three mile territorial waters of the United States, it is considered an export.<sup>69</sup> The State Department employs this construction even though it clearly did not promulgate the regulations with rocket launches in mind.<sup>70</sup>

The launch of a rocket thus constitutes an export because the rocket leaves the United States' jurisdiction and enters international waters. When a proposed flight plan calls for the rocket to land within the territorial waters of the United States, however, no export occurs and the State Department's regulations do not apply to the launch.<sup>71</sup> Similarly, when a United States company launches a rocket from beyond the jurisdiction of the United States—from international waters or another

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<sup>65</sup> 22 U.S.C. § 2778 (1976 & Supp. V 1981); see generally *id.* §§ 2751-2796. The State Department has promulgated regulations concerning rockets and launch vehicles. See 22 C.F.R. § 121.01 (1984).

<sup>66</sup> SIG REPORT, *supra* note 27; see International Traffic in Arms, 22 C.F.R. §§ 121-130 (1984).

<sup>67</sup> 22 C.F.R. § 121.01 (1984).

<sup>68</sup> 22 C.F.R. § 121.19 (1984).

<sup>69</sup> See *Hearings before the Subcomm. on Space Science and Applications of the House Comm. on Science and Technology, to Review H.R. 3942, The Expendable Launch Vehicle Commercialization Act*, 98th Cong., 2d Sess. at 76 (1984) (discussion between Representative Volkmer and Otho Eskin, Department of State) [hereinafter cited as *1984 Hearings*].

<sup>70</sup> See *id.* The regulations were originally issued before rocket flight became a reality. *Id.*

<sup>71</sup> See FAA Contact Memo, *supra* note 49, at 2 (waiver may be granted without State Department review if flight less than three miles); see also *infra* note 115 (no State Department review required because splashdown within territorial waters).

country—no export occurs and the State Department has less apparent interest in the launch. In the latter case, the State Department nonetheless may exercise some export control over the transport of the rocket from the United States to its launch site and may indeed be the only United States agency with any direct jurisdiction over the launch.<sup>72</sup>

### C. NASA's Regulatory Authority

NASA clearly has knowledge, expertise, and experience that is relevant to private ELV's.<sup>73</sup> It is less clear, however, whether NASA has any regulatory authority over private launches or whether NASA even has any institutional concern with respect to nongovernment activities.<sup>74</sup> In any event, however, it appears that NASA has no desire to function as a regulator of private ELV's.<sup>75</sup>

As a general matter, there appears to be no authority that gives NASA a role in the commercialization of space.<sup>76</sup> The National Aeronautics and Space Act of

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<sup>72</sup> This is apparently the case with respect to the recent launch by Starstruck, which planned to transport its rocket from the United States to the high seas for launch. That company indicated that in seeking approval for its launch it was "under the basic jurisdiction of the Department of State," rather than the FAA. *Commercialization Hearings*, *supra* note 3, at 233, 241 (statement of Bennett); *see also id.* at 245-46 (State Department temporary export permit is primary governing document for launch from international waters). Bennett stated that the company was seeking a temporary export permit from the Office of Munitions Control. *Id.* at 233. The application was referred to NASA, the FAA, and the Department of Defense. *Id.* The company also obtained a permit from the FCC. Moreover, the Department of State required the company to acquire insurance indemnifying the United States. *Id.* at 241.

<sup>73</sup> *See Myers*, *supra* note 16, at 5 (NASA has more technical expertise concerning launch vehicles and spacecraft than any other agency, except possibly the Department of Defense).

<sup>74</sup> *See id.* (although NASA has no direct authority over private ELV's, NASA's statutory authority arguably covers private space activities). At least one commentator has expressed the possibility that NASA could attempt to assert its jurisdiction over private ELV's launched from the United States. *See Dula*, *supra* note 42, at 26; *see also* Committee Print, *supra* note 2, at 33 (arguing NASA Act covers private launches).

<sup>75</sup> *See Commercialization Hearings*, *supra* note 3, at 36 (statement of Beggs) (NASA does not want to be in the regulatory business); *Myers*, *supra* note 16, at 5 (NASA has no "interest, responsibility or authority" to regulate private ELV's).

<sup>76</sup> *See Commercialization Hearings*, *supra* note 3, at 19. (statement of Klutznick).



1958<sup>77</sup> (Act) governs the United States government's civil space activities. The Act delegates to a civilian agency, NASA, responsibility for all "aeronautic and space activities *sponsored by the United States . . .*"<sup>78</sup> The Act defines aeronautical and space activities as "the development, construction, testing and operation *for research purposes* of aeronautical and space vehicles, and such other activities as may be required *for the exploration of space.*"<sup>79</sup> Moreover, the Act describes a space vehicle as "an object intended for launch, launched, or assembled in outer space, including the Space Shuttle . . ."<sup>80</sup>

While private ELV's would clearly fall within NASA's definition of a space vehicle, the language highlighted above strongly suggests that Congress did not intend for NASA to regulate private rocket launches. First, the United States does not *sponsor a private* launch, particularly if the enterprise does not utilize the government's facilities or services. When a company designs and builds its own space vehicle, launches the rocket from its own facilities, and conducts its own tracking and recovery, the government has extended no benefit to the enterprise, and the government has not endorsed, promoted, or otherwise sponsored that particular activity. Consequently, the launch is not within the jurisdiction of the Act. Even if the government provided launch facilities or a particular part of the rocket<sup>81</sup> the United States does not thereby sponsor the launch. The Supreme Court has indicated that even a grant of federal funds does not necessarily constitute sponsorship of the recipient's activities.<sup>82</sup> Certainly a mere contractual arrangement to provide launch facilities,

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<sup>77</sup> 72 Stat. 426 (1958) (current version at 42 U.S.C. §§ 2451-2477, 2481-2485 (1976 & Supp. V 1981)).

<sup>78</sup> *Id.* § 2451 (emphasis added).

<sup>79</sup> *Id.* § 2452 (emphasis added).

<sup>80</sup> *Id.*

<sup>81</sup> For instance, NASA sold to SSI the engine used to propel the Conestoga I. See *supra* note 3 (discussing NASA's sale of a booster to SSI). Arguably, this relationship constitutes "sponsorship."

<sup>82</sup> *Forsham v. Harris*, 445 U.S. 169, 179 (1980); see Dula, *supra* note 42, at 27 (discussing the sponsorship issue and *Forsham*).

like a federal grant, should not "convert the acts of the recipient from private acts to governmental acts absent extensive, detailed and virtually day-to-day supervision."<sup>83</sup>

One might also argue that the treaty obligations of the United States that place responsibility for private launches on the launching state<sup>84</sup> amount to sponsorship of the activity. While it is plausible that Congress sought to mandate some regulatory process by giving its advice and consent to the international space treaties, it is unlikely that Congress intended to extend the reach of the NASA Act to private launches. Moreover, the space treaties merely contemplate *international* liability of the launching state.<sup>85</sup> The United States incurs no liability for damage that occurs *domestically* as a result of being party to the space treaties.<sup>86</sup> Consequently, while the United States may "sponsor" launches for purposes of the liability convention, as a domestic matter the mere regulation of ELV's does not constitute sponsorship. If such were the case, the United States government would be a sponsor of virtually every commercial activity in the United States—an absurd notion.

Even if a private ELV is determined to be sponsored by the United States government, it is apparent that such activity would not be "for research purposes" or "for the

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<sup>83</sup> *Forsham*, 445 U.S. at 179.

<sup>84</sup> See Dula, *supra* note 42, at 27-28 (arguing acceptance of treaty obligations amounts to sponsorship).

The Convention on International Liability for Damage Caused by Space Objects, *opened for signature* Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762, provides that a launching state is absolutely liable to compensate for damage caused by its space object on the surface or to aircraft in flight. *Id.* art. 2. Because the term "launching state" includes a state from whose territory or facility a space object is launched, *id.* art. 1(c), the United States government would be liable to other states for damages caused by private space vehicles launched from the United States or its territorial waters. See Dula, *supra* note 42, at 28; see also *infra* notes 203-221 and accompanying text (discussing space treaties and United States obligations thereunder).

<sup>85</sup> See *infra* notes 217-225 and accompanying text (distinguishing between national and international liability).

<sup>86</sup> See *infra* note 222 and accompanying text.

exploration of space" as required by the Act.<sup>87</sup> Private enterprise is more interested in the application of technology to earn a profit than in making large expenditures on research and development.<sup>88</sup> Moreover, few, if any, private companies plan in the near future to launch space vehicles for mere explorative purposes. Exploration of space is not a profitable venture at this point in time, and no gratuitous contributors have surfaced to volunteer such private unprofitable missions. Any exploration or research and development that private industry undertakes will likely be incidental to other objectives or part of a long range profit-making project. In any event, the main functions of the industry will not fall within the jurisdiction of NASA, and no regulatory power is thus conferred on NASA by the Act.

Finally, if NASA has jurisdiction over private ELV's, no other agency's claim of jurisdiction would be appropriate. When NASA launches a rocket it has exclusive control over all aspects of the launch—safety, communications, timing, location, environmental impact, and the like. No other agencies assert regulatory authority over NASA launches. Even the FAA gave up any potential jurisdiction it may otherwise have held over the shuttle as an airplane.<sup>89</sup> Certainly if NASA has jurisdiction over private launches by virtue of the same legislation and language that confers its jurisdiction over United States government launches, the scope and nature of the authority should be the same. NASA would have the same exclusive jurisdiction over private launches as it has over its own launches. Such a conclusion, however, is inconsistent with the brief regulatory experience of the last two

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<sup>87</sup> See 42 U.S.C. § 2452 (1983).

<sup>88</sup> Certainly private companies conduct and will continue to conduct research and development activities (R & D) with respect to ELV's. Such R & D, however, is incidental to the profit motive, and does not alter the nature of the business to the traditional R & D role of NASA itself. See *Commercialization Hearings*, *supra* note 3, at 45 (statement of Walker) (NASA is primarily a research and development agency).

<sup>89</sup> See *supra* note 43 and accompanying text (FAA exempted shuttle from FAA regulations).

years<sup>90</sup> and contrary to the policy of the current administration, which apparently recognizes the competent jurisdiction of several agencies over private ELV's.<sup>91</sup> Consequently, NASA has no claim to jurisdiction over private ELV's, and its interest in participating in the regulatory process is due solely to its technical expertise and experience.<sup>92</sup>

Rather than exercising direct jurisdiction over certain aspects of private ELV's, NASA has participated in the regulatory process indirectly through the FAA and other regulatory bodies.<sup>93</sup> Because the licensing agencies generally lack the technical expertise necessary to approve rocket launch plans, they rely on NASA to perform the technical review of private launch plans.<sup>94</sup> Thus, in order to ascertain whether a particular launch or design will be safe, the FAA may require the applicant to obtain NASA's approval of the relevant technical aspects as a precondition to an exemption or waiver from the FAA regulations.<sup>95</sup>

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<sup>90</sup> See *infra* notes 113-199 and accompanying text (discussing regulatory experience of SSI and Starstruck).

<sup>91</sup> The current administration's policy contemplates that several federal agencies will exercise jurisdiction over private rocket launches. See DOT Press Release, *supra* note 28.

<sup>92</sup> NASA nonetheless apparently claims some jurisdiction over private space activities. NASA interprets international and domestic law as mandating its authorization and continual supervision of the activities of United States companies in space, regardless of whether the rocket is launched from the United States. See Dula, *Space Law for Business Planners*, 7 J. CONTEMP. BUS. 113, 121 (1978). Despite this fact, however, NASA has not asserted exclusive control over the previous private ELV's and has indicated no intent to expand its role. Moreover, NASA is not well-suited as a regulatory body and has no mandate from Congress to regulate. NASA can properly play a role in the regulatory scheme by putting to use its technical expertise and experience to draft safety guidelines, etc.

<sup>93</sup> See *Commercialization Hearings*, *supra* note 3, at 129 (statement of Abrahamson) (NASA has served as advisor to FAA, FCC and Department of State on technical characteristics of private launches); Myers, *supra* note 16, at 5 (NASA will play an important role in factual and technical questions). NASA has reviewed the plans of both SSI and Starstruck, although it was not directly involved in the regulation of either. *Id.* at 6. The regulating agencies relied on NASA's recommendations regarding the technical aspects of the launches because the licensing agencies lacked any technical competence. *Id.*

<sup>94</sup> Myers, *supra* note 16, at 6.

<sup>95</sup> See *supra* note 93 (discussing NASA's role in the regulatory process).

Moreover, NASA may exercise some authority over a private company that contracts to use NASA equipment or facilities.<sup>96</sup> For instance, NASA may require a company wishing to use NASA launching facilities to obtain third-party liability insurance to protect the United States from any liability.<sup>97</sup> NASA may also require such a private company to restrict the unauthorized publication or use of certain information,<sup>98</sup> or require disclosure to the public of certain aspects of the launch that bear on the public welfare.<sup>99</sup> NASA did assert some direct authority over the Conestoga I launch because NASA sold the booster engine used in that launch to SSI.<sup>100</sup>

#### D. Department of Defense

The interest of the Department of Defense in private ELV's is to protect the national security interests of the United States.<sup>101</sup> Nonetheless, it appears that this objective may be accomplished through the export license requirement or through the involvement of other agencies in the regulatory process.<sup>102</sup> The Department of Defense has indicated that it envisions no role for itself in regulating private launches that do not make use of Department

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<sup>96</sup> See 14 C.F.R. §§ 1204.1000-1003 (1984); Dula, *supra* note 42, at 30 (NASA may append certain conditions to authorization to use of NASA's tracking or launching facilities); Myers, *supra* note 16, at 6-7 (NASA will regulate many aspects of private ELV activities in its role as a lessor of facilities).

<sup>97</sup> See Mossinghoff, *Managing Tort Liability Risks in the Era of the Space Shuttle*, 7 J. SPACE L. 121, 122 (1979) (NASA's policy to require insurance).

<sup>98</sup> See 14 C.F.R. §§ 1203.400, 1206.300 (1984) (restrictions on certain information).

<sup>99</sup> See Dula, *supra* note 92, at 121.

<sup>100</sup> See MISSION REPORT, *supra* note 1, at 6. NASA assessed the technical and safety aspects of the launch prior to approving the sale of the booster. In addition, the sales agreement required SSI to purchase flight insurance to indemnify the United States. *Id.* See also Myers, *supra* note 16, at 6 (discussing NASA's careful review of the technical and safety aspects of the Conestoga I launch).

<sup>101</sup> See Committee Print, *supra* note 2, at 21 (discussing Department of Defense and national security); Ross, *The Department of Transportation's New Role in Commercializing Space Transportation*, FIRST ABA FORUM ON AIR AND SPACE LAW 5 (1984) (military and intelligence applications of launch must be considered).

<sup>102</sup> See Committee Print, *supra* note 2, at 21 (suggesting that a neutral agency should be responsible for resolving national security interests because the Defense Department may place too many constraints on the private sector).

of Defense facilities.<sup>103</sup> If a private enterprise wished to use the Defense Department launch facilities, however, the Department of Defense would impose minimal safety and oversight requirements, much like NASA.<sup>104</sup>

E. *Coast Guard*

Parts of ELV's generally fall into the ocean after a launch, to be recovered by the launching company. This creates potential dangers for commercial and pleasure sea-vessels. As the federal agency with jurisdiction over the territorial waters of the United States,<sup>105</sup> the Coast Guard has a duty to protect against such hazards. Consequently, the Coast Guard has a clear interest in the plans of private ELV companies.

F. *Bureau of Alcohol Tobacco and Firearms of the Department of Treasury*

The Bureau of Alcohol Tobacco and Firearms (BATF)<sup>106</sup> may assert some jurisdiction over private launches as well. A rocket falls within the definition of a destructive device under the Criminal Code's firearm provisions.<sup>107</sup> These provisions will apply if a company wants to import rockets or certain rocket parts into the United States. Such provisions are not, however, intrinsically tied to the launch of a rocket and arguably should remain independent of the launch regulatory process.

G. *Federal Communications Commission*

The Federal Communications Commission (FCC) controls the allocation of radio frequencies.<sup>108</sup> Because radio communication is essential to the control of unmanned

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<sup>103</sup> *Commercialization Hearings*, *supra* note 3, at 155 (statement of Colonel Jacoby, Department of Defense).

<sup>104</sup> *Id.*; Myers, *supra* note 16, at 10.

<sup>105</sup> Port and Waterways Safety Act, 33 U.S.C. §§ 1223(c), 1225 (1982).

<sup>106</sup> Gun Control Act of 1968, 18 U.S.C. § 921 (1982).

<sup>107</sup> 18 U.S.C. § 921 (1982).

<sup>108</sup> Federal Communications Act of 1934, 47 U.S.C. § 151-609. (1976 & Supp. V 1981).

space vehicles,<sup>109</sup> the FCC can assert some jurisdiction over private launches.<sup>110</sup> There is apparently nothing unique about the use of communication frequencies by launching companies, as the particular use of the frequency is of little consequence in such a case.<sup>111</sup> Nothing will be broadcast to the public. Therefore, the FCC should have little need to scrutinize private ELV applications and should routinely issue the requisite temporary or permanent license.

#### F. *North American Aerospace Defense Command*

The North American Aerospace Defense Command (NORAD) is the "watchdog" of outer space.<sup>112</sup> NORAD tracks all space objects and communicates any changes as appropriate to NASA and the Department of Defense. When a private company launches a space vehicle into space, it is important that NORAD be informed in advance so that the company can ensure that its rocket will not cross the path of any other space objects. Moreover, NORAD will help steer any proposed launch away from any sensitive military space objects or other dangerous or undesirable paths. NORAD can carry out this function on an informal basis for test flights that will not achieve orbit, but as the private ELV industry matures, the need for formal clearance through NORAD may increase.

## II. EXPERIENCE OF SPACE SERVICES INC. OF AMERICA AND STARSTRUCK

### A. *SSI's Percheron Experience*

SSI first contacted various federal agencies to obtain

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<sup>109</sup> Rocket launches from private launch sites require a frequency for several launch support functions, such as monitoring telemetry, radar tracking, and any self-destruct capability. Myers, *supra* note 16, at 10; see generally SIG REPORT, *supra* note 27, at App. B.

<sup>110</sup> See Committee Print, *supra* note 2, at 34-35.

<sup>111</sup> See Myers, *supra* note 16, at 10 (FCC review should be limited to communications issues since the FCC has little interest in other concerns).

<sup>112</sup> See generally *id.* at 11 (discussing role of NORAD and citing Covault, *Center Set for Soviet Space Monitoring*, AV. WEEK & SPACE TECH., Mar. 28, 1983, at 56).

any government clearances that were necessary to launch the Percheron, SSI's original expendable launch vehicle.<sup>113</sup> Because there was no comprehensive or cohesive regulatory process, SSI had to contact every agency and department that it perceived *might* have an interest in the launch.<sup>114</sup> At that time, there was no "lead agency" to coordinate the regulatory process, and no other enterprise had tested the waters by attempting to secure the necessary authorizations. Consequently, SSI was breaking new ground and had no guidance as to which agencies had interests to protect and what procedures such agencies might employ to protect their interests. For various reasons, however, SSI was eventually required to obtain formal clearances only from the FAA and the FCC.<sup>115</sup> SSI also made arrangements to secure the cooperation of the Navy in tracking and observing the launch vehicle.<sup>116</sup>

Of course, two essential contacts were with NASA and the FAA. Although NASA's interest had a questionable legal basis, it certainly had practical grounds. As the leading authority of the federal government on rockets and the like, NASA was in a unique position to evaluate factors such as safety and reliability. SSI ultimately did not obtain any particular blessing from NASA. Nonetheless, NASA was helpful in advising SSI on various technical matters and giving its stamp of approval to the FAA.

The FAA was the only agency with any explicit regulatory authority over private rocket launches. Nonetheless, SSI apparently had difficulty finding someone in the FAA

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<sup>113</sup> SSI designed and built the Percheron without any direct assistance from NASA.

<sup>114</sup> Arc Technologies, even though it began its approval process one year after SSI completed the process, still had to contact "every agency [they] thought *might* conceivably be involved and discussed it with all of them." *Commercialization Hearings*, *supra* note 3, at 245 (statement of Bennett) (emphasis added).

<sup>115</sup> *Id.* at 66 (statement of Hannah). No State Department review was necessary because the flight plan called for a splashdown 1.5 miles from the launch site, within the three mile territorial waters of the United States. *Id.*

<sup>116</sup> See Memorandum Re Naval Contact from Arthur M. Dula to David Ross (July 17, 1981), at 2-3 (discussing contracts and arrangements with Navy) (copy on file); Memorandum Re Percheron Launch from Arthur M. Dula to David Ross (July 17, 1981), at 1-2 (same) (copy on file).



who could respond to their launch proposal.<sup>117</sup> Ultimately the FAA advised SSI that under the FAA's regulations (FAR's),<sup>118</sup> SSI could launch its rocket only after obtaining either a waiver of or an exemption from the regulations.<sup>119</sup> An exemption would have given SSI the right to conduct more than one launch from their launch facility.<sup>120</sup> SSI ultimately obtained a waiver of the regulations authorizing a single launch of the *Percheron*.<sup>121</sup> SSI apparently chose the waiver route because the procedure involves a much shorter review period.<sup>122</sup>

SSI specifically requested a waiver of the regulations proscribing flights in controlled airspace and flights within five miles of the boundary of any airport.<sup>123</sup> The actual waiver form was a model of simplicity and required SSI to provide very little information.<sup>124</sup> In the application, SSI described its launch as a "single, nonrecurring, low altitude, flight test of the *Percheron* rocket engine test article."<sup>125</sup> The application also set forth the flight plan of

<sup>117</sup> See FAA Contact Memo, *supra* note 49, at 1 (discussing numerous efforts to locate a point of contact in the FAA).

<sup>118</sup> 14 C.F.R. §§ 101.23-.25 (1983).

<sup>119</sup> See *supra* notes 55-58 and accompanying text (discussing waiver or exemption requirement for launch).

<sup>120</sup> See FAA Contact Memo, *supra* note 49, at 3 (FAA prefers exemption process). The FAA apparently favored the exemption approach because it would completely remove the launch from the coverage of the FAR's, which were not designed to apply to commercial launches. *Id.*

<sup>121</sup> See Federal Aviation Administration, Certificate of Waiver or Authorization, Aug. 4, 1981 [hereinafter cited as FAA Waiver].

<sup>122</sup> See FAA Contact Memo, *supra* note 49, at 3 (SSI may convince FAA that a one-time waiver would be fairest approach).

SSI's first contact with the FAA apparently was sometime in early July, 1981. See *id.* at 1. (July 17 memo referring to contacts two weeks before). SSI filed its waiver application on July 23, 1981. SSI Application for Certificate of Waiver or Authorization (July 23, 1981) [hereinafter cited as SSI Application]. The FAA granted the waiver on August 4, 1981. FAA Waiver, *supra* note 121. The launch was scheduled for August 12, 1981. SSI Application, *supra* at 1. It would have been virtually impossible to obtain an exemption in this short period of time. See *infra* notes 141-145 and accompanying text (exemption process took nearly six months).

<sup>123</sup> SSI Application, *supra* note 122, Attachment at 1.

<sup>124</sup> See generally *id.* Virtually the entire application was blank with the "remarks" section containing more detail. *Id.* at 1-2.

<sup>125</sup> *Id.* at 1.

the Percheron, and included a two day launch window.<sup>126</sup>

SSI provided significantly more information, however, in an attachment to the waiver application. The attachment set forth the purpose of the launch, as well as a description of the rocket and launch site.<sup>127</sup> It also described the various safety precautions planned by SSI.<sup>128</sup>

The FAA granted the waiver two weeks after SSI submitted its application.<sup>129</sup> The waiver certificate set forth a number of special provisions, however, including certain safety requirements. Among the requirements were directives that

- the operator is responsible for scanning the airspace within nine miles of the launch site to keep the area clear of non-participating aircraft and water vessels;

- operations be conducted only between fifteen minutes after sunrise and ten o'clock a.m.;

- the operator must maintain direct communications with the local Air Traffic Control Center when operations are being conducted in controlled airspace;

- the FAA retains the right to cancel or amend the waiver if safety conditions so require or if the conditions of the launch change.<sup>130</sup>

Unfortunately for SSI, the Percheron never successfully made it off the ground. An explosion during an engine test destroyed the rocket,<sup>131</sup> temporarily halting SSI's drive to be the first United States company into space. Nonetheless, SSI's first experience at obtaining clearance to launch a private expendable space vehicle was relatively good in that few agencies were involved and the regulatory requirements were light.

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<sup>126</sup> See *id.*

<sup>127</sup> *Id.* Attachment at 1-2.

<sup>128</sup> *Id.* Attachment at 2-5.

<sup>129</sup> See FAA Waiver, *supra* note 121, at 2-3.

<sup>130</sup> *Id.*

<sup>131</sup> Petition, *supra* note 48, at 5.

## B. *The Conestoga Launch*

The regulatory approvals necessary to launch the Conestoga, however, were far more extensive. Because of various technical aspects of the launch<sup>132</sup> and its desire to obtain an exemption,<sup>133</sup> SSI had to obtain formal approvals from the Department of State and NASA, as well as the FAA and the FCC.<sup>134</sup> In addition, SSI had to register with the BATF,<sup>135</sup> and informally cooperated with the United States Navy, the Coast Guard, and NORAD.<sup>136</sup> The whole procedure took six months to complete and cost roughly \$250,000.<sup>137</sup> These time and cost factors constituted a substantial burden for SSI,<sup>138</sup> particularly because the launch was merely a test flight for the Conestoga.<sup>139</sup> Such impediments to rocket launches constitute an unnecessary and potentially crippling regulatory barrier to the creation of a private launch vehicle industry in the United States.

### 1. *FAA*

Rather than seeking a waiver of the FAA regulations, as it did in the Percheron case, SSI petitioned the FAA for an

<sup>132</sup> The Conestoga launch differed from the Percheron launch in two important respects. First, the launch called for a flight that would carry the rocket beyond the United States' territorial waters. See *MISSION REPORT*, *supra* note 1, at 19. Second, SSI used a rocket engine provided by NASA, rather than designing their own engine. See *id.* at 3.

<sup>133</sup> The FAA indicated to SSI that it should request an exemption for flights beyond United States territory or above 14,500 feet. See *Petition*, *supra* note 48, at 10.

<sup>134</sup> *MISSION REPORT*, *supra* note 1, at 6; *Commercialization Hearings*, *supra* note 3, at 60, 65 (statement of Hannah).

<sup>135</sup> *Commercialization Hearings*, *supra* note 3, at 60. SSI had to obtain a permit from the BATF in order to import several rockets used to test the guidance system. *Id.* Such approval generally should not be necessary because not all private launching companies will require such test rockets.

<sup>136</sup> *Id.* at 65.

<sup>137</sup> *Id.* at 66 (approval process took six months); *id.* at 101 (statement of Akaka) (process took six months and cost a quarter of a million dollars).

<sup>138</sup> *Id.* at 66 (statement of Hannah). SSI obtained the last approval just one day before the scheduled launch date.

<sup>139</sup> The Conestoga merely carried a water payload, rather than a commercial payload. See *MISSION REPORT*, *supra* note 1, at 5.

exemption from the regulations solely to launch the Conestoga.<sup>140</sup> Despite SSI's request for expedited treatment,<sup>141</sup> the approval process was rather time consuming. SSI filed its petition on March 16, 1982,<sup>142</sup> and received a favorable response on September 1, 1982,<sup>143</sup> almost six months later. In the interim, the FAA twice placed in the Federal Register a notice of the petition and a summary thereof,<sup>144</sup> despite SSI's request that this formality be waived.<sup>145</sup> Such notices are generally issued to give members of the public an opportunity to comment on the propriety of the proposed activity.<sup>146</sup> In the second notice, the FAA indicated that certain actions and stipulations would be necessary to provide the requisite level of safety in conjunction with the exemption.<sup>147</sup> These included:

(1) establishment of a temporary restricted area within domestic airspace to isolate the rocket from other air traffic operations;

(2) operational parameters, outside of which the vehicle's thrust would be terminated;

(3) domestic and international notices to airmen and mariners defining the flight plan;

(4) direct communication between the launch operator and the local air traffic control;

(5) restrictions in IFR flight operations in affected in-

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<sup>140</sup> Petition, *supra* note 48. Although an exemption may cover more than one launch, SSI requested an exemption solely for the Conestoga. *Id.* at 6.

<sup>141</sup> *Id.* at 1-2.

<sup>142</sup> *Id.* at cover page.

<sup>143</sup> In re Space Services, Inc., of America, Grant of Exemption (Sept. 1, 1982) (announced in 47 Fed. Reg. 16,243 (1982) [hereinafter cited as Exemption]).

<sup>144</sup> 47 Fed. Reg. 16,243 (Apr. 15, 1982) (first notice); 47 Fed. Reg. 32,229 (July 26, 1982) (second notice).

<sup>145</sup> See Petition, *supra* note 48, at 2 (requesting waiver of time limits, procedural requirements, and publication in Federal Register of summary petition); Supplemental Letter, *supra* note 3 (submitting that second comment period was "totally unnecessary" and would "probably delay the proposed launch at considerable expense to SSI.")

<sup>146</sup> 14 C.F.R. § 11.27(c), (e), (g) (1984). See 47 Fed. Reg. 16,243 (Apr. 15, 1982); 47 Fed. Reg. 32,229 (July 26, 1982).

<sup>147</sup> 47 Fed. Reg. at 32,230.

ternational air space.<sup>148</sup>

In its petition SSI requested a launch window of virtually two months in order to give it time to overcome any delays that might arise.<sup>149</sup> The petition described both the Conestoga and the launch site, and included attachments that set forth all of the technical aspects and capabilities of the launch vehicle.<sup>150</sup> The petition also detailed the proposed flight path of the Conestoga, which did not cross any permanent human habitations or foreign territory.<sup>151</sup> After generally describing the history of SSI, the petition explained the relationship between SSI and other enterprises involved in the launch.<sup>152</sup> Additionally, the petition designated the flight as a "sub-orbital test simulating payload orbital injection,"<sup>153</sup> and discussed the future potential of the Conestoga rocket.<sup>154</sup>

One of the more important portions of the petition set forth the safety precautions planned by SSI.<sup>155</sup> With respect to personnel, SSI hired an experienced launch contractor and experienced engineering consultants.<sup>156</sup> The use of the reliable Minuteman I rocket motor further enhanced the presumption of safety.<sup>157</sup> The petition also specified safety measures including:

- safe distances between the launch pad and the control facilities and viewing areas;
- a barricade to protect the control facilities;
- portable fire fighting equipment;
- security and onsite operations personnel;

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<sup>148</sup> *Id.* (no comments received in response to the first notice). *See id.* No comments were received with regard to the second notice. Exemption, *supra* note 143, at 1.

<sup>149</sup> Petition, *supra* note 48, at 2.

<sup>150</sup> *Id.* at 3.

<sup>151</sup> *Id.* at 4.

<sup>152</sup> *Id.* at 4-5.

<sup>153</sup> *Id.* at 5.

<sup>154</sup> *Id.* at 6. The production model Conestoga rocket will be capable of placing satellites in orbit. *Id.* at 6.

<sup>155</sup> *Id.* at 6-7.

<sup>156</sup> *Id.* at 6.

<sup>157</sup> *See id.* at 3.

- media announcements of the launch time and flight plan;
- direct communications with the local FAA air traffic control center; and
- a radio initiated self-destruct device.<sup>158</sup>

SSI also proposed that the FAA issue appropriate safety warnings to warn aircraft and sea vessels of the flight plan.<sup>159</sup>

SSI urged in its petition that the Conestoga launch should be exempt from FAR Part 101, Subpart C,<sup>160</sup> the exclusive FAA regulations applicable to private rocket launches.<sup>161</sup> The argument advanced in support of an exemption from the regulations was relatively simple. SSI asserted primarily that the existing regulations did not contemplate private launches on the large scale of the Conestoga and emphasized the safety precautions taken by SSI.<sup>162</sup>

The FAA granted SSI a partial exemption from the regulations<sup>163</sup> and established a temporary restricted area around the launch site.<sup>164</sup> Specifically, the FAA eliminated the proscriptions against the operation of a rocket in controlled airspace or within five miles of the boundary of an airport.<sup>165</sup> The FAA, however, denied an exemption from the remaining provisions of FAR Part 101, Subpart C.<sup>166</sup> The FAA reasoned that several of the provisions

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<sup>158</sup> *Id.* at 6-7.

<sup>159</sup> *Id.* at 7. The FAA apparently issued air and safety warnings for the Conestoga launch. See Myers, *supra* note 16, at 5.

<sup>160</sup> See *supra* notes 44-47 and accompanying text (discussing and quoting FAA regulations concerning rocket launches).

<sup>161</sup> Petition, *supra* note 48, at 9-11. SSI also requested an exemption from any other regulations that the FAA may deem applicable. *Id.* at 11.

<sup>162</sup> *Id.* at 10.

<sup>163</sup> Exemption, *supra* note 143, at 3.

<sup>164</sup> Establishment of Temporary Restricted Area R-6303, Matagorda Island, Texas, 47 Fed. Reg. 34,363 (Aug. 9, 1982). Included in the notice's restricted area was the airspace covered by SSI's flight plan. *Id.* The FAA determined that the notice and public procedure otherwise required would be counterproductive and that the regulation thus would take effect in less than thirty days after its publication. *Id.*

<sup>165</sup> *Id.*

<sup>166</sup> Exemption, *supra* note 143, at 3.

amounted to a "clear weather environment" requirement that could not be satisfied by air traffic control surveillance and public notice.<sup>167</sup> Such actions did not constitute "an equivalent level of safety."<sup>168</sup> Consequently, SSI needed ideal weather conditions to initiate the launch.

The FAA also imposed certain other conditions on its approval. The grant of exemption required SSI to enter into an agreement with a nearby airport to close the airport during the launch, to maintain insurance coverage in the amount of \$100 million, and to ensure that the rocket did not stray beyond certain parameters.<sup>169</sup> The order also required direct regular communication prior to the launch between SSI and the Houston Air Traffic Control Center, which had the authority to delay the launch for safety reasons.<sup>170</sup> Finally, the authorization imposed a general duty on SSI to "delay, cancel, or terminate . . . [the] rocket operation at any time the safety of persons or property is jeopardized."<sup>171</sup>

## 2. *Department of State*

Although SSI believed that an export license was not appropriate for the launch of the Conestoga,<sup>172</sup> SSI submitted a letter to the office of Munitions Control of the Department of State on April 15, 1982,<sup>173</sup> requesting the requisite approval, in response to informal suggestions from the State Department that SSI's launch might re-

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<sup>167</sup> *Id.* at 2.

<sup>168</sup> *Id.*

<sup>169</sup> *Id.* at 3-5.

<sup>170</sup> *Id.* at 3-4.

<sup>171</sup> *Id.* at 5.

<sup>172</sup> See Memorandum Re Status of Request for Export License from James R. Myers to Charles M. Chafer (Aug. 25, 1982), at 1 (export license not necessary or appropriate) [hereinafter cited as Export License Memo]; SSI requested license without challenge only to expedite processing); Letter from James V. Carroll to Charles R. Hartley, Office of Munitions Control (Apr. 16, 1982) [hereinafter cited as Carroll Letter].

<sup>173</sup> Carroll Letter, *supra* note 172. SSI submitted a cover letter and the other relevant information because the export license form did not accommodate the information pertinent to the launch of an ELV. See Export License Memo, *supra* note 172, at 1.

quire an export permit.<sup>174</sup> Obtaining the Department of State approval proved to be somewhat difficult.<sup>175</sup> As of June 4, 1982, the Office of Munitions Control had not received all of the comments from the various relevant administrative agencies and no determination had been reached as to whether an export permit was required.<sup>176</sup> Despite the fact that the State Department had delivered a written statement to the FAA as of August 25, 1982, indicating that it had no objections to the launch,<sup>177</sup> the Department of State did not issue the necessary export authorization to SSI until September 7, 1982,<sup>178</sup> just one day before the scheduled launch.

The Office of Munitions Control of the Department of State granted SSI's request for approval under the Arms Export Control Act to launch the Conestoga, subject to certain conditions and limitations.<sup>179</sup> Specifically, the Department of State limited its authorization to the Conestoga launch, indicating that subsequent launches would require a separate review and approval.<sup>180</sup> The Department of State also based its authorization on the understanding that SSI had agreed to comply with the various safety requirements imposed on the launch by NASA and the FAA.<sup>181</sup> The approval was subject to the understanding that SSI had obtained \$100 million of insurance for

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<sup>174</sup> See Export License Memo, *supra* note 172, at 1; Carroll Letter, *supra* note 172.

<sup>175</sup> See generally Export License Memo, *supra* note 172 (discussing lengthy State Department approval process). At one point, just two weeks prior to the launch, the State Department indicated that it could not issue an export license prior to the scheduled launch date despite the fact that NASA and the FAA already had satisfied all of the State Department concerns and had communicated to the FAA that they had no objections to the launch. See Export License Memo, *supra* note 172, at 3.

<sup>176</sup> Export License Memo, *supra* note 172, at 2.

<sup>177</sup> See *id.* at 3.

<sup>178</sup> Letter from William B. Robinson, Director, Office of Munitions Control, to James R. Myers (Sept. 7, 1982) (approving SSI's request for export license) [hereinafter cited as DOS Approval].

<sup>179</sup> *Id.*

<sup>180</sup> *Id.*

<sup>181</sup> *Id.*



any damages resulting from the launch.<sup>182</sup> Finally, the consent letter required SSI to indemnify the United States government for any damages and expenses that might arise in connection with the launch, including any payments made pursuant to any treaty.<sup>183</sup>

### 3. *NASA*

Because NASA sold the booster used by SSI to launch the Conestoga, NASA exercised some control over the launch. Prior to approving the sale of the engine, NASA assessed the technical and safety aspects of the launch and reviewed some of the documentation prepared by SSI for other agencies.<sup>184</sup> The sales contract itself also required that SSI obtain flight insurance to indemnify the United States government.<sup>185</sup> NASA's interest in the launch, however, went no further than the booster purchase agreement.

In addition to the above specific requirements, SSI obtained a temporary permit from the FCC to operate a radio frequency to communicate with the Conestoga.<sup>186</sup> SSI also cooperated informally with NORAD and the Department of Defense,<sup>187</sup> apparently satisfying any and all concerns.

### C. *Starstruck's Dolphin*

Starstruck attempted to launch its rocket, the Dolphin, from an ocean platform in international waters off the coast of California.<sup>188</sup> Due largely to the location of the launch outside of the United States territorial waters, the

<sup>182</sup> *Id.*

<sup>183</sup> *Id.*

<sup>184</sup> MISSION REPORT, *supra* note 1, at 6; see Supplemental Letter, *supra* note 3 (NASA agreed to provide SSI with a booster after intensive review of launch plans, technical expertise, range safety, insurance, and development plans).

<sup>185</sup> MISSION REPORT, *supra* note 1, at 6.

<sup>186</sup> Myers, *supra* note 16, at 10; see *Commercialization Hearings*, *supra* note 3, at 65 (SSI obtained formal approval from FCC).

<sup>187</sup> *Commercialization Hearings*, *supra* note 3, at 65.

<sup>188</sup> *Dolphin Launch*, *supra* note 5, at 6; see *Commercialization Hearings*, *supra* note 3, at 232 (statement of Bennett).

Department of State, rather than the FAA, was the primary government body to regulate the company.<sup>189</sup> In fact, the FAA had no jurisdiction and Starstruck technically did not have to comply with the FAA regulations. Consequently, Starstruck did not have to apply for a waiver or an exemption from the FAA regulations.<sup>190</sup> The FAA nonetheless played a part in the process via the Department of State and the interagency approval procedure.<sup>191</sup>

The Department of State regulation of Starstruck was also significantly different from the approach taken in the SSI launch of the Conestoga I. Because Starstruck was not planning to launch *from* United States territory into international airspace, the launch itself did not qualify as an export.<sup>192</sup> As a result, the *launch* did not require an export permit from the Department of State. Nonetheless, an export permit was necessary merely to *transport* the rocket to the launch site.<sup>193</sup> Such transport constitutes an export in the usual sense of the word, so there is little question as to the propriety of the Department of State's regulatory function.

The Department of State used its jurisdiction over the launch vehicle to obtain information comparable to that required of SSI. Additionally, by referring the information to NASA, the FAA, and the Department of Defense, the Department of State was able to ensure that the launch posed no safety problems.<sup>194</sup> The State Depart-

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<sup>189</sup> *Commercialization Hearings*, *supra* note 3, at 233, 241. (Starstruck under basic jurisdiction of State Department); Myers, *supra* note 16, at 5 (suggesting FAA regulations not applicable because launch not from United States territory).

<sup>190</sup> Myers, *supra* note 16, at 5.

<sup>191</sup> *See id.* (FAA involvement in Dolphin launch coordinated through State Department export license procedures).

<sup>192</sup> *See supra* note 68 and accompanying text (export refers to sending article "out of the United States").

<sup>193</sup> *See Commercialization Hearings*, *supra* note 3, at 245-46 (statement of Bennett) (export permit primary governing document in Starstruck launch); Myers, *supra* note 16, at 8 (State Department granted Starstruck export license for Dolphin).

<sup>194</sup> *Commercialization Hearings*, *supra* note 3, at 241 (statement of Bennett) (export permit primary governing document in Starstruck launch); Myers, *supra* note 16, at 8 (State Department granted Starstruck export license for Dolphin).

ment required Starstruck to obtain indemnity insurance for the United States as well.<sup>195</sup> Thus, the Department of State used its export jurisdiction to reach the substantive regulatory requirements that were ultimately imposed on the launch. It is not clear that the State Department had the authority to extend its consideration of the export license to the particulars of the launch. It is appropriate, however, for the Department of State to consider in issuing export permits the uses to which the item will be put after its export. Consequently, the jurisdiction of the State Department over launch activities of private companies is arguably more appropriate in launches from international waters than it is in launches from the territorial United States.

Starstruck had informal conversations with many other agencies, but was required to obtain only one other license. In addition to the export license, Starstruck had to obtain an experimental radio license from the FCC.<sup>196</sup>

Because Starstruck's original launch attempt was not successful<sup>197</sup> and it needed approval of a new launch date, it became the first private enterprise to operate under the Department of Transportation's leadership.<sup>198</sup> Soon after the first scrubbed launch, Starstruck officials met with Department of Transportation officials to determine the appropriate procedures for rescheduling the launch in March of 1984.<sup>199</sup>

Although some of the approvals and arrangements were relatively easy to obtain, the experience of SSI clearly reveals the need to streamline the regulatory process imposed on private ELV launches. Moreover, Starstruck, despite the groundbreaking experience of SSI, had to reinvent the wheel one year later because its plans were

<sup>195</sup> *Commercialization Hearings*, *supra* note 3, at 241.

<sup>196</sup> *See id.* at 233; Myers, *supra* note 128, at 10.

<sup>197</sup> *See supra* notes 5-6 and accompanying text (discussing Starstruck's attempts to launch the Dolphin).

<sup>198</sup> *See Dolphin Launch*, *supra* note 5, at 7; *1984 Hearings*, *supra* note 69, at 47-8 (statement of Jenna Dorn, Department of Transportation).

<sup>199</sup> *See Dolphin Launch*, *supra* note 5, at 7.

different from those of SSI. Starstruck thus had to go through the same time-consuming process of contacting every agency that "might conceivably be involved."<sup>200</sup> It is "[t]his kind of unnecessary red tape [that] entails costly delays and might discourage [the] private sector investment in the space launch business."<sup>201</sup> Indeed there is a consensus that the various regulatory agencies need to coordinate their efforts to allow the ELV industry to grow without having to overcome a burdensome regulatory quagmire. In response to this consensus the administration designated the Department of Transportation as the lead agency.<sup>202</sup> Several questions remain, however: Does the executive branch have the authority to regulate private ELV's? If so, is the DOT the appropriate agency to direct the regulatory reform? What should be the function and structure of the lead agency? And finally, what are the concerns that the regulations should address? The next three sections of this article attempt to respond to these questions.

### III. AUTHORITY AND DUTY OF UNITED STATES GOVERNMENT TO REGULATE PRIVATE ELV'S UNDER DOMESTIC AND INTERNATIONAL LAW

Any analysis of the regulatory system in the United States must begin with the United States' international responsibility to regulate private ELV's. Perhaps more important, however, is its authority under domestic law to regulate private rockets. Generally, when Congress determines that the government should regulate an industry, it passes authorizing legislation that delegates the regulatory responsibility to a particular agency. Because there is no such authorizing legislation, the current source of the domestic power to regulate private ELV's is unclear.

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<sup>200</sup> *Commercialization Hearings*, *supra* note 3, at 245 (statement of Bennett); *see also supra* note 114 (discussing Arc Technologies).

<sup>201</sup> *Commercialization Hearings*, *supra* note 3, at 114 (statement of Akaka).

<sup>202</sup> DOT Press Release, *supra* note 28.

A. *International and Liability Obligations to Regulate*

The Outer Space Treaty of 1967 (OST)<sup>203</sup> requires that states parties ensure that all activities conducted in space by their nationals are consistent with the provisions of the treaty. The OST states that:

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies *shall require authorization and continuing supervision* by the appropriate State Party to the Treaty.<sup>204</sup>

The provision does not distinguish between the activities of a state and the space activities of that state's private enterprises.<sup>205</sup> Moreover, a state party that carries on its registry an object launched into space "shall retain jurisdiction and control over such object."<sup>206</sup> Thus the treaty clearly contemplates private space activities<sup>207</sup> and mandates that states parties take responsibility for such activities, even if the state does not exercise any direct or indirect control over such activities.<sup>208</sup>

<sup>203</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter cited as OST].

<sup>204</sup> *Id.* at 6 (emphasis added). It is important to note that "responsibility" for private space activities is much broader than "liability" for such launches. Gorove, *Liability of the State and Private Companies for Mishaps Involving Space Activities*, FIRST ABA FORUM ON AIR AND SPACE LAW, at 2 (1984).

<sup>205</sup> See Committee Print, *supra* note 2, at 24.

<sup>206</sup> OST, *supra* note 203, art. 8.

<sup>207</sup> Originally the USSR maintained that private enterprise should not be allowed to participate in space activities. They argued that only nation-states should conduct space activities. The Soviet Union eventually agreed to the contrary, however, and the OST makes clear the legal status of private space activities under international law. LAY & TAUBENFELD, *THE LAW RELATIVE TO ACTIVITIES OF MAN IN SPACE*, 92-3 (1970).

<sup>208</sup> N. MATTE, *AEROSPACE LAW: TELECOMMUNICATIONS SATELLITE* 81 (1982).

Under the OST, states parties must ensure that the activities of their nationals conform to the other provisions of the treaty.<sup>209</sup> The fundamental principles that the United States must apply to private space companies through regulations to fulfill its OST obligations include:

(1) space, including celestial bodies, is the province of mankind and should be developed for mankind's benefit;<sup>210</sup>

(2) space, including celestial bodies, is free for exploration, use, and exploitation by all;<sup>211</sup>

(3) space, including celestial bodies, is not subject to appropriation by any nation;<sup>212</sup>

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<sup>209</sup> OST, *supra* note 203, art. 6.

<sup>210</sup> *Id.* preamble, art. 1. The OST states that space, including celestial bodies, should be used for the "benefit of all peoples," and is the "province of mankind." *Id.* For purposes of space law, "the province of mankind" has the same meaning as "benefit of mankind." C. CHRISTOL, *THE MODERN INTERNATIONAL LAW OF OUTER SPACE* 42, 252 (1982).

<sup>211</sup> OST, *supra* note 203, art. 1. The OST provides that "[o]uter space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies." OST, *supra* note 203, art. 1. Although the treaty refers only to free exploration and use, its legislative history demonstrates that article one applies also to exploitation of natural resources. C. CHRISTOL, *supra* note 210, at 39-42; see U. N. Doc. A/AC.105/C.2/SR. 202 (1972), *reprinted in* 4 N. JASENTULIYANA & R. LEE, *MANUAL ON SPACE LAW* 128, 129-30 (1981) (Committee on the Peaceful Uses of Outer Space [COPUOS] delegate from Italy asserting OST laid down principle of freedom of all states to exploit lunar resources); O. OGUNBANWO, *INTERNATIONAL LAW AND OUTER SPACE ACTIVITIES* 65 (1975) (freedom to use outer space includes freedom to exploit through extraction of minerals); S. BHATT, *LEGAL CONTROLS OF OUTER SPACE* 153 (1973) (freedom to use is freedom to exploit moon and its resources as well as space). The right to exploit the resources of space is consistent with the free access requirements of the treaty. C. CHRISTOL, *supra* note 210, at 41.

<sup>212</sup> OST, *supra* note 203, art. 2. The OST provides that "outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." OST, *supra* note 203, art. 2. This provision of the OST generally has not been interpreted as prohibiting the appropriation of celestial body resources. O. OGUNBANWO, *supra* note 211, at 217; C. CHRISTOL, *supra* note 210, at 277.

In 1976 a group of eight equatorial countries challenged the nonappropriation principle by adopting what is now known as the "Bogota Declaration." International Telecommunication Union, Broadcasting Satellite Conference, Doc. No. 81-E (Jan. 17, 1977), Annex 4, *reprinted in* 6 J. SPACE L. 193 (1978). In the Declaration the countries claimed sovereignty over portions of the geostationary orbit,

(4) celestial bodies shall be used only for peaceful purposes;<sup>213</sup>

(5) international law extends to space and celestial bodies;<sup>214</sup> and

(6) those conducting space activities should avoid terrestrial environmental damage.<sup>215</sup>

Although this is not an exhaustive list of all relevant provisions incorporated in the OST that govern activities in space, the others are relatively less important and are not discussed here.<sup>216</sup>

Another OST provision imposes liability on a state for the private space activities of its nationals. Article 7 provides that:

each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its national or juridical persons by such object or its component parts on the Earth, in air space or in outer space, including the moon and celestial bodies.<sup>217</sup>

The Liability Convention of 1972<sup>218</sup> further clarifies and

which is located approximately 35,800 kilometers above the equator and is the most valuable location for a communications satellite. Gorbil, *The Legal Status of Geostationary Orbit: Some Remarks*, 6 J. SPACE L. 171 (1978). Many delegates sharply attacked the claim to ownership and one commentator dismissed it as "preposterous." *Id.* at 176-77.

<sup>213</sup> OST, *supra* note 203, art. 4. Although the peaceful purposes provision of the OST covers only the moon and other celestial bodies, OST, *supra* note 203, art. 4, it is generally understood that all of space should be used only for peaceful purposes. See C. CHRISTOL, *supra* note 210, at 22-36 (discussing scope of peaceful purposes principle).

<sup>214</sup> OST, *supra* note 203, art. 3. The OST provides that "international law, including the Charter of the United Nations," applies to outer space and celestial bodies. OST, *supra* note 203, art. 3. The incorporation of international law into space law indicates that international legal principles determine the extent to which treaty provisions are binding, and that the corpus of international law supplements the coverage of existing space law. C. CHRISTOL, *supra* note 210, at 48.

<sup>215</sup> OST, *supra* note 203, art. 9.

<sup>216</sup> For a more complete discussion of the OST, see generally C. CHRISTOL, *supra* note 210.

<sup>217</sup> OST, *supra* note 203, art. 7.

<sup>218</sup> Convention on International Liability for Damage Caused by Space Objects, opened for signature Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762 [hereinafter cited as Liability Convention].

expands on this directive, providing that "[a] launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight."<sup>219</sup> The Liability Convention defines a launching state as a state that "launches or procures the launching of a space object" or a state "from whose territory or facility a space object is launched."<sup>220</sup> Thus the United States is primarily liable under international law for purely private space vehicles that launch from the United States or its territorial waters.<sup>221</sup>

The Liability Convention does not apply, however, to damage to a United States national caused by a United States private space vehicle.<sup>222</sup> Consequently, claimants within the United States would have to resort to domestic law remedies. For instance, the injured party may proceed against the United States government under the Federal Tort Claims Act,<sup>223</sup> although the liability of the government with respect to private rocket launches even under this act is highly suspect. Alternatively, a claimant could sue the launching company itself under the appropriate state tort law.<sup>224</sup> In appropriate circumstances a court might find the enterprise to be strictly liable because of the "abnormally dangerous" character of a rocket launch and recovery.<sup>225</sup>

Finally, the Registration Convention<sup>226</sup> requires that the United States register on an international registry all space objects launched from its territory.<sup>227</sup> The Secretary-General of the United Nations maintains the registry,

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<sup>219</sup> *Id.* art. 2.

<sup>220</sup> *Id.* art. 1(c).

<sup>221</sup> See Committee Print, *supra* note 2, at 23-24.

<sup>222</sup> The Convention specifically indicates that it does not apply to damage caused by a space object of a launching state to one of its nationals. Liability Convention, *supra* note 218, art. 7(a).

<sup>223</sup> 28 U.S.C. § 1346 (1976).

<sup>224</sup> Dula, *supra* note 92, at 117.

<sup>225</sup> *Id.*

<sup>226</sup> Convention on the Registration of Objects Launched into Outer Space, opened for signature on Jan. 14, 1975, 28 U.S.T. 695, T.I.A.S. No. 8480.

<sup>227</sup> *Id.* art. 2.



to which all nations have full and open access.<sup>228</sup> This registration obligation further establishes the international responsibility of the United States for its private ELV launches.

### B. *Authorization for Domestic Regulation*

Although the space treaties mandate that the United States regulate private ELV's, it is not clear whether, as a domestic matter, the executive branch has the authority to regulate the industry. The President has only those powers expressly granted to the executive branch by the Constitution and those delegated to certain administrative agencies by acts of Congress. Although it gave its advice and consent to the OST, Congress has not adopted any legislation specifically authorizing an agency to issue regulations to regulate private ELV's.<sup>229</sup> To the extent that

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<sup>228</sup> *Id.* art. 3.

<sup>229</sup> Representative Akaka introduced a bill concerning the commercialization of expendable launch vehicles on September 21, 1983. H.R. 3942, 98th Cong., 1st Sess., 129 CONG. REC. E171 (daily ed. Jan. 27, 1983), previously introduced as H.R. 7411, 97th Cong., 2d Sess., 128 CONG. REC. E5377 (daily ed. Dec. 21, 1982). A bill has also been introduced in the Senate. S. 560, 98th Cong., 1st Sess., 129 CONG. REC. S1507 (daily ed. Feb. 23, 1983). The Subcommittee on Space Science and Applications held hearings on H.R. 3942, but only one witness, Elizabeth Dole, accompanied by Jeffrey N. Shane and Jenna Dorn, testified. *See ELV Hearings, supra* note 25. The Subcommittee held further hearings on March 29, 1984, to further consider H.R. 3942. *1984 Hearings, supra* note 69, at 43 (statement of Representative Volkmer).

At the mark-up session held subsequently, the Subcommittee failed to reach a consensus on the degree of authority that should be vested in the Department of Transportation. Some Congressmen argued that DOT should have exclusive regulatory authority, as advocated by this article. Others asserted that the other federal agencies should retain their jurisdiction over ELV's. *Space Legislation Bogged Down Temporarily*, J. COM., Apr. 6, 1984, at 2A.

Eventually, the Subcommittee approved a version of the bill that would give the DOT virtually exclusive regulatory power over ELV's. J. COM., April 12, 1984, at 1A.

The full Committee on Science and Technology subsequently adopted the legislation and referred it to the House of Representatives. H.R. REP. NO. 98-816, 98th Cong., 2d Sess. (1984). The House passed H.R. 3942 on June 5, 1984. 130 CONG. REC. H 5220 (daily ed. June 5, 1984). The Senate Commerce Committee plans to draft its own legislation and may take action on the matter as soon as August, 1984.

The legislation adopted by the House provides for a regulatory structure quite similar to that advocated by this article. *See* H.R. 3942, 98th Cong., 2d Sess.

the regulation of private space activities is a foreign affairs matter, the President might be able to issue regulations by virtue of the extensive power over foreign affairs vested in the executive branch.<sup>230</sup> It may be difficult, however, despite the obvious international implications of space activities, to extend the foreign affairs power to what is in fact a domestic regulatory matter.

It is more likely that the executive could derive the requisite regulatory power from the OST itself. Article 6 of the United States Constitution provides that "all Treaties made . . . under the Authority of the United States, shall be the supreme Law of the Land."<sup>231</sup> A treaty will operate as federal law, however, only if it is self-executing in that it requires no further implementing legislation to become part of the domestic law of the United States.<sup>232</sup> If the OST is a self-executing treaty, the provisions of the treaty are directly applicable to private enterprises and the executive branch has the power to issue regulations to enforce the provisions.<sup>233</sup> The President would need no additional legislation to authorize regulations. Rather, the self-executing mandate in the OST that the United States

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(1984). While the contents of the bill are appropriate at the current time, if passed by the Senate, the structure would be set in stone. Once it is codified, it will be more difficult to adapt the regulatory structure to reflect the experience of the DOT. If the DOT followed the approach of H.R. 3942 under the authority of an executive order, rather than legislation, it would have the flexibility to make major changes in the regulatory structure if appropriate. For this reason, Congress should withhold making a legislative response to private ELV's until the DOT has had an opportunity to test a comprehensive regulatory approach and identify the needs of the public and the industry. The scant experience of the government in regulating the SSI and Starstruck rockets is not a sufficient basis for creating a permanent regulatory structure.

<sup>230</sup> See *Whitney v. Robertson*, 124 U.S. 190 (1887). See generally *United States v. Curtiss-Wright Export Corp.*, 299 U.S. 304 (1936) (discussing broad foreign affairs power of President); see also *Youngstown Sheet & Tube Co. v. Sawyer*, 343 U.S. 579 (1952) (defining nature of President's foreign affairs power).

<sup>231</sup> U.S. CONST. art. VI, cl. 2.

<sup>232</sup> *Valentine v. United States ex rel Neidecker*, 299 U.S. 5 (1936); RESTATEMENT (SECOND) OF FOREIGN RELATIONS LAW § 141(1) (1962).

<sup>233</sup> The United States Constitution provides that the President "shall take care that the laws be faithfully executed." U.S. CONST. art. II, § 3. Thus the President may direct the appropriate agency of the executive branch to issue regulations to carry out the federal law.

must authorize and continually supervise private space activities would confer sufficient power on the executive to devise appropriate regulations.

### 1. *What is a Self-executing Treaty?*

A treaty that manifests an intention that it shall become effective as domestic law of the United States at the same time that it becomes binding on the United States is self-executing and supercedes any prior inconsistent law.<sup>234</sup> Ultimately, it is the courts that resolve the question of self-execution, as a matter of interpretation, provided the issue arises in litigation.<sup>235</sup> The initial determination as to whether a particular treaty is self-executing, however, belongs to the executive branch.<sup>236</sup> Consequently, if the President determines that the Outer Space Treaty is self-executing and issues regulations to enforce its provisions, the regulations will be valid unless a court later determines that the President's interpretation was incorrect. In making such an interpretation, a court is to give *great weight* to the interpretation made by the executive branch.<sup>237</sup> Thus, as a practical matter, it is unlikely that a decision by the President would fall in litigation unless it lacked a reasonably justifiable basis.

Generally, a treaty is "to be regarded in courts of justice as equivalent to an act of the legislature, whenever it operates of itself without the aid of any legislative provision."<sup>238</sup> This approach is of little assistance in evaluating the authority of the executive branch to implement a

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<sup>234</sup> RESTATEMENT (SECOND) FOREIGN RELATIONS LAW §§ 141(1) and 154(2) (1962).

<sup>235</sup> *Id.* § 154.

<sup>236</sup> *Id.* § 149. The President has the authority to interpret the international effect of international agreements. *Id.* Moreover, because the courts cannot interpret a treaty until it is brought before them in litigation, and Congress cannot effectively interpret an international agreement, the executive branch must perform the task as an ambit of its foreign affairs powers.

<sup>237</sup> *Id.* § 152. The factors that a court will consider generally in interpreting a treaty are set forth in Restatement section 147. *Id.* § 147.

<sup>238</sup> *Foster v. Nielson*, 27 U.S. 253, 314 (1829).

treaty.<sup>239</sup> One commentator has thus concluded that a treaty is self-executing when it "by [its] own terms can be carried into effect by administrative authorities . . . [and] can be implemented by the executive branch itself without recourse to congressional action."<sup>240</sup>

The primary criterion in determining whether a particular treaty is self-executing is whether the parties intended the agreement to become binding and enforceable without any implementing legislation.<sup>241</sup> The most important factor in evaluating the intent of the parties is the language employed in the document.<sup>242</sup> Thus, if possible, a court will find a treaty to be self-operative if reasonably possible within the scope of the language.<sup>243</sup> Courts will also find a treaty to be self-executing if the provisions of the treaty "prescribe a rule by which the rights of the private citizen or subject may be determined."<sup>244</sup>

A court may also look at other factors bearing on the interpretation, the most prevalent of which is the construction adopted by the executive branch.<sup>245</sup> Courts appropriately give great deference to the opinion of the President, the formulator of the treaty.<sup>246</sup> At least one court has suggested that a treaty should be considered self-executing if the President did not request any implementing legislation when the treaty was transmitted for the advice and consent of the Senate.<sup>247</sup>

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<sup>239</sup> See Evans, *Self-Executing Treaties in the United States of America*, 30 BRIT. Y.B. INT'L L. 178, 185 (1953) (court in *Foster* overlooked the fact that the executive may implement a treaty).

<sup>240</sup> *Id.* at 193.

<sup>241</sup> *Jones v. Meehan*, 175 U.S. 1, 10 (1899); see also Henry, *When is a Treaty Self-Executing*, 27 MICH. L. REV. 776 (1929); Note, *Self-Execution of United Nations Security Council Resolutions Under United States Laws*, 24 UCLA REV. L. 387, 390-391 (1976).

<sup>242</sup> *Maiorano v. Baltimore & O. R.R.*, 213 U.S. 268, 273 (1909); *Diggs v. Richardson*, 555 F.2d 848, 851 (D.C. Cir. 1976).

<sup>243</sup> See Comment, *Treaties — Article 6 of the Convention on the High Seas Is Not Self-Executing: U.S. v. Postal*, 55 NOTRE DAME LAW. 293, 299-300 (1979).

<sup>244</sup> *Head Money Cases*, 112 U.S. 580, 598-99 (1884).

<sup>245</sup> Comment, *supra* note 243, at 298.

<sup>246</sup> See *Aerovias Interamericanas De Panama v. Board of County Comm'rs*, 197 F. Supp. 230, 247 (S.D. Fla. 1961) *rev'd*, 307 F.2d 802 (5th Cir. 1962); Comment, *supra* note 243, at 298.

<sup>247</sup> *Aerovias*, 197 F. Supp. at 248; see also RESTATEMENT (SECOND) OF FOREIGN

2. *Is the Outer Space Treaty Self-Executing?*

Although at least one commentator has suggested that the Outer Space Treaty is not self-executing,<sup>248</sup> it is apparent that the parties to the OST clearly intended that each state would supervise the space activities of its nationals. This mandate gives the executive power to prescribe the particular rules and regulations, guided by the principles of the treaty, to implement the treaty in domestic United States law.<sup>249</sup>

An examination of the language of the OST suggests that the drafters and parties intended to impose on all parties an affirmative obligation to regulate private space activities. The treaty specifies that states "*shall*" bear international responsibility for "*assuring*" that private entities conduct their activities in conformance with the provisions of the treaty.<sup>250</sup> The treaty provides further that private activities "*shall*" require authorization and continued supervision.<sup>251</sup> These are not discretionary provisions. The language does not leave the parties free, at their leisure, to regulate private activities as they deem it appropriate. Rather, the treaty uses obligatory language that requires states to regulate in order to assure conformance with the treaty provisions.<sup>252</sup> The regulatory requirement is not subject to further authorizing legislation of the various parties. Rather, it mandates that regulations be imposed, and it creates an obligation that

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RELATIONS LAW § 140 comment b, illustration 4 (1962) (discussing President's duty to request implementing legislation).

<sup>248</sup> See Dula, *supra* note 92, at 117; Letter from Art Dula to Ralph Drury Martin, Attorney-Advisor, Office of the Legal Advisor, Department of State, July 13, 1981.

<sup>249</sup> See *supra* note 233 and accompanying text (President has authority to enforce a self-executing treaty through rules and regulations).

<sup>250</sup> OST, *supra* note 203, art. 6.

<sup>251</sup> *Id.* (emphasis added). One commentator suggests that the authorization and supervision provisions "seem to be directly addressed to physical persons and juridical entities." Vereshchetin, *International Space Law and Domestic Law: Problems of Interrelations*, 9 J. SPACE L. 31, 36 (1981); see also Bockstiegel, *Legal Implications of Commercial Space Activities*, PROCEEDINGS OF THE TWENTY-FOURTH COLLOQUIUM ON THE LAW OF OUTER SPACE 1, 12 (1981) (Outer Space Treaty applies to commercial space activities by private industry).

<sup>252</sup> See Vereshchetin, *supra* note 251, at 40.

private individuals and states could enforce against the United States if the government failed to properly regulate the space activities of its nationals.

The Department of State has at least implicitly indicated that it believes that the OST is self-executing.<sup>253</sup> Moreover, although the President has not issued a formal statement with respect to the question of whether the treaty is self-executing, the executive apparently made such a determination prior to directing the DOT to act as the lead regulatory agency.<sup>254</sup> In addition, the President, at the time the treaty was ratified by the United States, did not seek any implementing legislation. Thus, not only has the executive implicitly decided that the treaty is self-executing, any court passing on the matter would give great deference to this judgment. Finally, Congress apparently approves of the executive branch's regulatory actions to date. Congress has passed no legislation altering the existing procedures and has not indicated that legislation is necessary to regulate private ELV's.<sup>255</sup>

Perhaps the most compelling justification for allowing

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<sup>253</sup> SSI originally maintained in a legal memorandum delivered to the Department of State that the regulatory and supervision provisions of the OST are not self-executing and that such provisions do not constrain private activities absent legislation by Congress. See Letter from Ralph Drury Martin, Attorney-Advisor, Office of the Legal Advisor, Department of State, to Charles M. Chafer, June 24, 1981 (noting SSI's legal advisor's opinion that relevant provision of OST not self-executing). The State Department responded that it would carefully consider the opinion but that the Department had not accepted that view. *Id.* In light of the State Department's subsequent regulation of the SSI launch activities, it seems clear that the Department views the treaty as self-executing. Otherwise, its export permit procedure would not legally be able to address issues extraneous to the actual export of the rocket. Moreover, the Department of State has indicated that "[a] mechanism is already in place which provides the necessary control over launches and payloads to comply with the international obligations of the United States and to ensure that its foreign policy and security interests are protected." 1984 Hearings, *supra* note 69, at 72 (statement of Otho Eskin, Director, Office of Advanced Technology, Bureau of Oceans and International, Environmental and Scientific Affairs, Department of State).

<sup>254</sup> See Finch, *Space Commercialization and Evolving Public International Law*, FIRST ABA FORUM ON AIR AND SPACE LAW, at 2 (1984) (President's announcement implemented nationally the legal regulatory environment of space commercialization).

<sup>255</sup> See Myers, *supra* note 16, at 11 (Congress willing to approve private launches without legislation specifically addressing private ELV's). Even if Congress even-

the executive branch to regulate private ELV's under the Outer Space Treaty is the responsibility of the United States to fully execute all international obligations.<sup>256</sup> A state may not use its failure to adopt domestic legislation to evade its international obligations.<sup>257</sup> More specifically, the Vienna Convention on the Law of Treaties states that "[a] party may not invoke the provisions of its internal law as justification for its failure to perform a treaty."<sup>258</sup> To flaunt the obligations imposed on the United States by the OST would thus violate international law. As a consequence, it would be most prudent for the government, as a domestic matter, to deem the treaty to be self-executing and issue appropriate regulations thereunder.

#### IV. STRUCTURE OF THE REGULATORY PROCESS

##### A. Lead Agency

There is little consensus as to which agency or department should coordinate the establishment of the ELV regulations. At least seven agencies or departments have been mentioned as the appropriate body to take over the lead agency role, including NASA, the FAA, the FCC, the

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tually adopts legislation establishing a regulatory structure, Congress has not suggested that such legislation is *necessary* to implement the OST.

<sup>256</sup> G. SCHWARTZENBERGER & E. BROWN, A MANUAL OF INTERNATIONAL LAW 136 (6th ed. 1976); Houben, *Principles of International Law Concerning Friendly Relations and Co-operation Among States*, 61 AM. J. INT'L L. 703 (1967).

In this regard, one commentator has reasoned in the context of the Outer Space Treaty that:

[h]aving undertaken an international treaty obligation, a State owing to the principle of *pacta sunt servanda* is bound to undertake all the necessary measures to prevent the violation of the obligation by actions of its physical or juridical entities. International law leaves the choice of the relevant techniques and means to the discretion of the State concerned, without predetermining the mechanism of the national implementation of the rules of international law.

Vereschetin, *supra* note 251, at 37.

<sup>257</sup> *Harvard Research on the Law of Treaties, Draft Convention, with Comment, Prepared by the Research in International Law of the Harvard Law School*, 29 AM. J. INT'L L. SPEC. SUPP. 653, 1029 (1935); see generally Vereschetin, *supra* note 251, at 37.

<sup>258</sup> Vienna Convention on the Law of Treaties, art. 27, U.N. Doc. A/Conf. 39/27 (1969), reprinted in 63 AM. J. INT'L L. 875 (1969), 8 INT'L LEGAL MATERIALS 679 (1969).

Department of Defense, the State Department, the Department of Commerce, and the Department of Transportation.<sup>259</sup> In November of 1983, after several working groups had considered the matter, the administration decided to give the responsibility to the DOT.<sup>260</sup> Since that time, the DOT has focused on coordinating the regulatory agencies in order to streamline the regulatory process.<sup>261</sup>

It appears that lodging the central regulatory authority in a yet to be created agency within the DOT—a “Launch Agency”—is the most appropriate method of streamlining the regulatory process. First, expendable launch vehicles are the first carriers in an emerging private space transportation industry. Private enterprise will use ELV’s to transport space objects into space. It is a transportation industry and thus is appropriately regulated by the department given jurisdiction over transportation. Second, the most important agency in the confused regulatory process to date has been the FAA. By far the most time-consuming and extensive approval process encountered by SSI was the FAA exemption.<sup>262</sup> Because any lead agency must work closely with the FAA, an agency within the DOT would be in an ideal position to work with the FAA to establish meaningful regulations for private ELV’s. An intra-agency relationship in this respect would facilitate communication greatly and possibly result in a more cohesive approach.

In any event, it seems clear that no other single agency should perform the lead agency task. NASA is not the appropriate body to act as the lead agency in the regulation of private ELV’s. Perhaps the best reason not to have

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<sup>259</sup> See *Commercialization Hearings*, *supra* note 3, at 101 (statement of Akaka) (recognizing as possible lead agency FAA, FCC, Department of Defense, Department of State; recommending Department of Commerce); Committee Print, *supra* note 2, at 20 (four agencies as possible lead agency: Department of Commerce, Department of Transportation (specifically the FAA), Department of State, and NASA).

<sup>260</sup> DOT Press Release, *supra* note 28.

<sup>261</sup> *Id.*

<sup>262</sup> See *supra* notes 142-143 and accompanying text (FAA exemption procedure took six months).



NASA as the lead agency is that NASA is not and does not want to be a regulatory body.<sup>263</sup> NASA's most effective role is as a supporting agency that can lend its technical experience and advice without directly regulating specific launches.<sup>264</sup> Moreover, as the promoter of the shuttle, NASA may have a conflict of interest in regulating private ELV's.<sup>265</sup>

SSI favors the FAA as the lead agency,<sup>266</sup> probably because of the relationships that SSI has already established with the FAA.<sup>267</sup> SSI views the FAA as an "action agency" that has experience in dealing with the kinds of concerns and business that ELV's present.<sup>268</sup> A bill introduced into the Senate would also adopt the FAA as the lead agency,<sup>269</sup> due to its experience in the related area of aeronautics.<sup>270</sup> While the aviation industry is related, the FAA itself has little technical expertise in the field of space launches.<sup>271</sup> Rather than expanding the FAA and complicating its regulatory mission, it would be more appropriate to delegate the lead agency tasks to a parallel agency within the DOT. Moreover, the FAA has no jurisdiction over launches outside the United States and has no mandate to regulate space vehicles once they leave United States air space.<sup>272</sup>

Similarly, the FCC is not the ideal agency to regulate and promote launch activities. The FCC does issue licenses for the use of communications frequencies, but otherwise, the agency has no nexus to or experience with

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<sup>263</sup> See *supra* note 75 and accompanying text (NASA does not want to regulate ELV industry).

<sup>264</sup> See *Commercialization Hearings*, *supra* note 3, at 67, 71 (statement of Hannah) (suggesting NASA role as supporting agency; NASA can provide technical insights to lead agency).

<sup>265</sup> See Committee Print, *supra* note 2, at 20 (NASA may have a conflict of interest).

<sup>266</sup> *Commercialization Hearings*, *supra* note 3, at 61 (statement of Hannah).

<sup>267</sup> *Id.*

<sup>268</sup> *Id.*

<sup>269</sup> S. 560, 98th Cong., 1st Sess. (1983).

<sup>270</sup> See Committee Print, *supra* note 2, at 20.

<sup>271</sup> See *Commercialization Hearings*, *supra* note 3, at 101 (statement of Akaka).

<sup>272</sup> *Id.*

the private ELV's.<sup>273</sup> The FCC has been chosen as the agency to regulate satellite communications.<sup>274</sup> However, the FCC has no interest in regulating launch vehicles. Satellites, regardless of their intended use, are payloads—not launch vehicles. Thus while the FCC may properly regulate some use of the private objects put into space by private industry, the FCC has little interest in regulating the payload delivery systems.

The Department of State, although appointed as the interim lead agency prior to the designation of the DOT, would not be the best choice for the lead agency. The State Department's primary interest is in ensuring that the United States meets its treaty obligations and that any export concerns are satisfied.<sup>275</sup> Some believe that the State Department would not be able to create the proper regulatory climate to encourage and promote private space activities.<sup>276</sup> Moreover, the State Department apparently has difficulty discharging its current space policy responsibilities concerning international telecommunications.<sup>277</sup>

Similarly, the Department of Defense is clearly not the proper regulatory body for private space activities. Although the Defense Department has a role in establishing the export controls of the United States, this is a relatively limited aspect of the approval process once the policy decision to encourage private launchings is made. While the United States must ensure that the private sector uses space only for peaceful purposes,<sup>278</sup> this concern should not dominate the government's regulatory process. Moreover, the lead agency should encourage and facilitate the development of a private ELV industry. As a

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<sup>273</sup> See *id.* (FCC has limited expertise in space related areas).

<sup>274</sup> See Myers, *supra* note 16, at 9-10 (FCC regulates satellite communications).

<sup>275</sup> See *supra* notes 62-72 and accompanying text (discussing Department of State concerns).

<sup>276</sup> *Commercialization Hearings*, *supra* note 3, at 102, 116, 139.

<sup>277</sup> *Id.* at 116 (statement of Akaka). See also *id.* at 144 (Statement of Nelson) (State Department "does not know often one hand from the other what it's doing").

<sup>278</sup> See *supra* note 213 and accompanying text.

military body the Defense Department is ill-suited to promote such a civilian business. Finally, the Department of Defense has no mandate to regulate private industry in any civilian context.<sup>279</sup> As Representative Akaka put it, the Department of Defense "has better things to do."<sup>280</sup> The Department of Defense should, of course, exercise authority over any private launches conducted from its facilities.

Representative Akaka originally advocated placing the primary regulatory responsibility in the Department of Commerce, asserting that the Department of Commerce has the necessary legislative mandate and that the ELV industry is a component of commerce.<sup>281</sup> While this may be correct, the Commerce Department has less technical expertise than any other agency mentioned above. Moreover, the Commerce Department lacks any clear departmental direction and would thus absorb the lead agency as just another agency under the Commerce umbrella. In Akaka's revised legislation,<sup>282</sup> the DOT replaces the Department of Commerce as the lead agency,<sup>283</sup> thus suggesting that the Department of Commerce is no longer a likely candidate for the lead agency position.

#### B. *Structure of the Regulatory Process and Functions of the Launch Agency*

The Executive Order directing the DOT to oversee the regulation of private ELV operations lists a number of responsibilities of the lead agency.<sup>284</sup> The Order provides that the DOT shall, *inter alia*,

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<sup>279</sup> *Commercialization Hearings*, *supra* note 3, at 101 (statement of Akaka).

<sup>280</sup> *Id.*

<sup>281</sup> *Id.* Representative Akaka explained that "we are creating a new industry in this country and, as such, from a philosophic and policy point of view, this industry belongs under the Department of Commerce." *Id.* Akaka had introduced legislation that would establish the Department of Commerce as the lead agency. See *supra* note 229 (discussing H.R. 3942).

<sup>282</sup> H.R. REP. NO. 3942, 98th Cong., 2d Sess. 2 (1984).

<sup>283</sup> *Id.* § 4(8) at 3.

<sup>284</sup> See ELV Executive Order, *supra* note 32, § 2, at 7211.

- promote and encourage commercial ELV operations;
- lead the establishment of procedures to expedite private launch approvals;
- serve as the single point of contact for the collection and distribution of ELV license applications and documentation;
- recommend administrative measures to streamline federal licensing procedures.<sup>285</sup>

The Order also officially establishes an interagency group to advise and assist the DOT in carrying out its responsibilities.<sup>286</sup> The Order further directs all departments and agencies to:

- provide the Department of Transportation with information on relevant regulatory actions;
- eliminate unnecessary regulatory obstacles to ELV development and ensure that essential regulations are administered as efficiently as possible;
- establish timetables for expeditious treatment of applications for approval of ELV activities.<sup>287</sup>

Moreover, the Order makes clear that it does not “diminish or abrogate any statutory or operational authority exercised by any other Federal agency.”<sup>288</sup> Thus the Order actually confers very little power on the DOT.

Consistent with this conclusion, the DOT has indicated that each of the agencies concerned will retain their regulatory authority.<sup>289</sup> Rather than taking over any existing regulatory roles, the DOT claims promotional and deregulatory roles.<sup>290</sup> In its promotional function the DOT will focus on reducing customs burdens<sup>291</sup> to attract for-

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<sup>285</sup> *Id.*

<sup>286</sup> *Id.* The interagency group is composed of representatives from the Department of State, the Department of Defense, the Department of Commerce, the FCC, and NASA. *Id.*

<sup>287</sup> *Id.* at 7211-12.

<sup>288</sup> *Id.* at 7212.

<sup>289</sup> DOT Press Release, *supra* note 28, at 2.

<sup>290</sup> Ross, *supra* note 101, at 2.

<sup>291</sup> *Id.* If a user in a foreign country must pay an expensive customs duty to take its payload into the United States for a launch, United States ELV companies will be at a competitive disadvantage in the world launch services market. Companies

oreign payloads, to promote favorable tax treatment of the ELV industry, and examine other potential barriers to development.<sup>292</sup> In its deregulatory mode the DOT will attempt to reduce the government regulation and paperwork to that required to protect the domestic and international interests of the United States.<sup>293</sup> In this capacity, the DOT will work with the seventeen agencies that have "colorable claims to jurisdiction over private rocket launches in order to determine which are truly valid jurisdictional claims."<sup>294</sup> The DOT will also *encourage* these agencies to simplify their procedures and expedite their decision-making.<sup>295</sup> Finally, the DOT intends to establish a "one stop shopping" procedure—a single point of contact for launching companies to determine what approvals are necessary for a particular launch.<sup>296</sup> Thus the DOT will simply serve to gather all of the relevant information from the applicant and disseminate it to the various agencies. Although the Launch Agency could impose time limitations to speed up the process and eliminate duplicative interagency approvals, there will still be several separate approvals necessary to launch.

It therefore appears that the lead agency, rather than issuing a single license to launch, will merely coordinate the efforts of the various agencies to *reduce* the regulatory burden. This move will not, however, *minimize* the regulatory burden. It will be difficult for the DOT to weed out inappropriate or burdensome regulations when it lacks the power to implement its determinations. If the DOT

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launching from nations that impose a smaller duty on the importation of the payload will have an artificial advantage.

<sup>292</sup> *Id.*

<sup>293</sup> *Id.* Apparently one of the reasons that the President assigned the lead agency task to the DOT was the agency's successful experience in deregulating other modes of transportation. *See id.*

<sup>294</sup> *Id.* at 3. The DOT has suggested that some assertions of jurisdiction are inappropriate, indicating that "some . . . claims have more 'color' than others." *Id.*

<sup>295</sup> *Id.* The DOT will facilitate negotiations between the applicant and the government agencies by "explaining an applicant's case before another agency." *Id.*

<sup>296</sup> *Id.* *See also ELV Hearings, supra* note 25, at 6.

evaluates a particular launch and concludes that no export license is necessary to protect the interests of the United States, the State Department may nonetheless require such a permit. Rather than decreasing interdepartmental jealousies by preserving each agency's jurisdiction, conflicts between the agencies will increase to the extent that agencies disagree with the propriety of the DOT's advice. In this context, the "lead agency" is merely an advisory board coordinating the regulation of private ELV's.

It would be more appropriate to establish within the DOT a separate agency to regulate ELV operations.<sup>297</sup> This Launch Agency should, working with the other relevant agencies,<sup>298</sup> establish and apply a single set of guidelines or regulations to govern private launches.<sup>299</sup> Private companies wishing to launch a rocket would then take the necessary information to the Launch Agency, and within a stated time period, receive an authorization to launch. The Launch Agency could draw upon the expertise of NASA, the FAA, and the State Department as necessary to apply and interpret the regulations until such time as the

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<sup>297</sup> SIG REPORT, *supra* note 27, at II ("DOT/FAA should be responsible for administering commercial launch range safety regulations, once developed").

<sup>298</sup> The Launch Agency should also give the industry and other interested parties, as well as Congress, an opportunity to comment on the proposed regulations. *Id.* at 1.

<sup>299</sup> See generally SIG REPORT, *supra* note 27.

The SIG Group recommended that the "Lead Agency chair an interagency group of affected Federal agencies and those that possess appropriate technical and operational expertise in space launches to develop the minimum necessary procedures or regulations for licensing and supervising commercial ELV launch range operations from [United States] commercial ranges." SIG REPORT, *supra* note 27, at 5. In addition, the Working Group recommended that "the DOT/FAA be responsible for administering these commercial launch range safety regulations once developed." *Id.* While the Group suggested that the individual agencies should otherwise retain their regulatory authority, *id.*, it appears that there is little reason not to consolidate all functions into one agency once the technical range regulations have been established. See *contra* ELV Hearings, *supra* note 25, at 5 (each agency with regulatory authority should be permitted to retain authority; centralization may impede progress). While it may be necessary to allow each agency initially to keep its jurisdiction, the approval process eventually should be consolidated into one Launch Agency.

Launch Agency could develop similar expertise.<sup>300</sup> Otherwise, a launching company still must obtain several separate approvals before it can legally launch a rocket.

Further, it remains unclear which approvals are in fact necessary. An export license, for instance, should not be required simply to launch a rocket.<sup>301</sup> Although a launch that entails a flight plan that goes beyond the United State's territorial waters is technically an export,<sup>302</sup> the concerns of the Office of Munitions generally associated with an export of weapons do not arise with the launch of a space vehicle. Any portions of the rocket that will fall into the ocean will generally be recovered by the launcher. Consequently, the rocket is unlikely to enter another state or otherwise leave the control of the launching company. The only legitimate concerns of the Department of State are the compliance with any treaty obligations of the United States and the indemnification of any liability resulting from the launch. An export permit is not necessary to satisfy these interests. It seems anomolous to require an export permit for rockets when hundreds of airplanes departing from the United States bound for foreign countries need not obtain an export permit.<sup>303</sup>

If the Department of State wants to address such concerns, it should do so in a straightforward manner by contributing to the design of the regulations. There is no need for the Department of State to independently evaluate factors that are addressed by the regulations. Indeed,

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<sup>300</sup> See *ELV Hearings*, *supra* note 25, at 5 (acquisition of technical expertise by single agency will take time).

<sup>301</sup> See *Myers*, *supra* note 16, at 8 (questioning whether there is legal basis for an imposing an export license requirement on private launches). Apparently, private ELV companies have complied with the export license procedure to avoid a lengthy and expensive challenge to the Department of State's claimed authority. See *id.*

<sup>302</sup> See *supra* notes 65-70 and accompanying text (discussing application of export laws to rocket launches).

<sup>303</sup> See 15 C.F.R. § 370.3 (1984) (export license required for all commodities and technical data, with some exceptions). See also *Commercialization Hearings*, *supra* note 3, at 81 (statement of David Hannah, Jr.) (government not liable for aircraft landing in foreign countries; should not be liable for spacecraft landing overseas).

the Department of State has been negotiating with the DOT to transfer to the lead agency in the DOT the approval authority under the export regulations.<sup>304</sup> If the lead agency can adequately perform this function, there is no reason to retain the approval based on the export laws and regulations. In any event, if the Department of State retains its regulatory power over ELV's, the export license requirement will inappropriately remain in place.

Coordination by the DOT also does nothing to effectuate a change in the FAA regulations. The discussion above demonstrates that regulations drafted for amateur rocketeers are inadequate for commercial launches. The FAA, however, should not adopt new regulations that it would apply through the intermediary DOT lead agency. Rather, the FAA should work with NASA and the DOT to draft new regulations that a Launch Agency could employ. Thereafter, both the FAA and NASA, as appropriate and necessary, could conduct the necessary review of a particular private launch proposal. This "interagency" aspect of the process hopefully could be reduced over time and eventually eliminated as the Launch Agency acquires the expertise needed to apply the regulations.

With respect to the FCC's jurisdiction, there appears to be nothing about a launching company's request for a frequency that would raise different concerns than other FCC requests. Thus this routine frequency assignment easily could be handled between the Launch Agency and the FCC without extensive investigation by the FCC. Moreover, when a company establishes a permanent launch site and acquires a permanent frequency, only one initial request need be filed.<sup>305</sup> The FCC could take itself entirely out of the regulation process simply by allocating

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<sup>304</sup> See generally *1984 Hearings*, *supra* note 69 (various parties discussing the negotiations); see also *id.* at 7 (statement of Jenna Dorn, Office of Commercial Space Transportation, DOT).

<sup>305</sup> See *Myers*, *supra* note 16, at 10. (permanent license from FCC necessary for permanent private launch sites with regular and frequent launches).



a frequency to the Launch Agency to use in granting private companies approval to launch.

Finally, a truly "one-stop shop" cannot exist until an enterprise can obtain responses to all of its questions and satisfy all requirements through a single agency. While this cannot be done overnight, it makes little sense to wait until the maturity of the industry demands such an agency. If the government waits until then, it will be forced to act overnight to reallocate the necessary skills into a new agency. It would be far better for a Launch Agency to mature along with the industry.

The DOT has insisted that it would be inappropriate or otherwise burdensome to create a single regulatory agency for private ELV's.<sup>306</sup> The true reason for this position, however, is unclear. The DOT asserts that the regulatory structure must retain flexibility to allow it to respond to various different launch situations and technologies.<sup>307</sup> The DOT assumes that a single set of regulations would be more restrictive than the current multi-agency approach.<sup>308</sup> It is not enough to say, as the DOT argues, that the involvement of several agencies is not as significant a problem as the lack of refined interagency procedures to minimize duplication and maximize coordination.<sup>309</sup> If all of the various government concerns were addressed by a single agency, no "interagency" procedures would be necessary. There simply is no reason to continue the "day to day contact" between the commercial ELV agency and other agencies<sup>310</sup> when a less bur-

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<sup>306</sup> *ELV Hearings*, *supra* note 25, at 5; *1984 Hearings*, *supra* note 69, at 48, 51 (statement of Jenna Dorn).

<sup>307</sup> *1984 Hearings*, *supra* note 69, at 46 (statement of Jenna Dorn). The Director of the Office of Commercial Space Transportation repeatedly asserted the need for flexibility and questioned the propriety of adopting a single set of regulations. *See generally id.* Yet, the Director could never explain why flexibility could not be retained in a consolidated regulatory structure.

<sup>308</sup> *See 1984 Hearings*, *supra* note 69, at 46-47, 48, 50-51.

<sup>309</sup> *See id.* at 46-47.

<sup>310</sup> The Department of Transportation noted that it had virtually "day-to-day contact" with the various federal agencies when reviewing the Starstruck case. *Id.* at 47.

densome and less time consuming approach is available.

Moreover, it is not at all clear how the adoption of a single regulatory agency would necessarily increase regulation or otherwise be counterproductive. The DOT emphasizes the need for flexibility in the regulatory process, by arguing that because all possible problems cannot be anticipated by a single regulatory structure and that it is too early to establish an extensive set of rules and regulations to govern all launches.<sup>311</sup> It is difficult to understand why the retention of several separate regulatory bodies increases flexibility. Indeed, a single agency could employ the existing regulations far more efficiently and effectively than a consortium of self-interested government agencies and departments. While it may be too early to establish extensive regulations, it is not too early to establish a single regulatory agency that can grow with the industry and develop the appropriate regulations over time.

Finally, even the DOT has apparently recognized the benefits of putting the entire regulatory structure under one roof. The DOT is attempting to shift to the lead agency the launch approval process now handled by the Department of State through the ITAR process.<sup>312</sup> Thus, rather than shunning the centralization of regulatory authority, the DOT appears to approve of such a move in practice. The advantages of this consolidation would properly be maximized by placing full regulatory authority for rocket launches and payloads in a single Launch Agency. A single regulatory body implementing a single

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<sup>311</sup> *Id.* at 46, 51.

<sup>312</sup> *Id.* at 49. Another contradiction in the DOT's approach to the regulatory process is evident in its desire to establish a predictable regulatory structure, *id.* at 46, while retaining the current hodgepodge of regulating agencies. See ELV Executive Order, *supra* note 32 (federal agencies retain all existing authority). It will be quite difficult to provide certainty when no single authority can tell an entrepreneur at any point in time precisely what minimum requirements must be met for a launch. For instance, new technologies will require a new response from fifteen different agencies under the current system. A single Launch Agency, however, could provide a single harmonized response to new technologies in a much shorter time period.

flexible set of regulations would better minimize the regulatory burden on private rocket launches than would a large group of autonomous bodies employing regulations that were designed for unrelated purposes.

## V. CONTENT OF THE LAUNCH AGENCY REGULATIONS

While the Launch Agency regulations would primarily be substantive, any complete and technical discussion of the appropriate substantive measures is beyond the competence of this article. Rather, this section of the article discusses generally some of the substantive areas that would be appropriately addressed by the Launch Agency, as well as a number of important procedural concerns that the Launch Agency should consider in establishing the private ELV regulations.

### A. *Time Limits*

Needless to say, the long delay in obtaining the requisite approval from the Department of State in the SSI case<sup>313</sup> is unsettling and should not be allowed to occur under future regulatory procedures. Thus, the Launch Agency should establish short but reasonable mandatory time limitations on the approval process, perhaps in the sixty to ninety day range. When the Launch Agency receives an application it should immediately disseminate the pertinent information to any relevant agencies and require prompt response.<sup>314</sup> This would enable the Launch Agency to issue a final permit in a relatively short period of time.

One factor adding to the delay in obtaining launch approval in the SSI case was the interagency comment procedure. Under this procedure, each agency had to request and receive comments from other affected agencies prior

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<sup>313</sup> See *supra* notes 175-178 and accompanying text (discussing delay caused by Department of State).

<sup>314</sup> See SIG REPORT, *supra* note 27, at 12 (recommending 30 day limit on responses from various agencies to Lead Agency).

to issuing its authorization.<sup>315</sup> The State Department process illustrates this duplication problem well. The State Department's three primary concerns had all been satisfied by authorizations issued by other agencies.<sup>316</sup> Yet, SSI was unable to expedite its application for an export license from the State Department by communicating this information to the Department.<sup>317</sup> The State Department's lethargic response thus threatened to delay the launch of the Conestoga even though all relevant concerns had been addressed. SSI encountered the same difficulty in obtaining its exemption from the FAA regulations.

The root of the problem was the lack of confidence of each agency in the competence of the other agencies to adequately protect the interests of the public and government. The lack of trust resulted in the imposition of similar requirements by several different bodies.<sup>318</sup> This delay and duplication can be eliminated by doing away with the interagency comment procedure. If each agency restricts its review to its own area of expertise, the Launch Agency could coordinate the comments of the various interested government parties and issue a single launch permit. Each agency will know that a final permit will not issue until all have commented on the proposed launch.

Another aspect of the regulatory process that unneces-

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<sup>315</sup> See Ross, *supra* note 101, at 3 (too much "redundancy" in reviews of NASA, FAA, and Department of Defense on SSI launch).

<sup>316</sup> The Department of State ultimately required in its approval of the Conestoga launch that SSI obtain insurance, agree to comply with NASA and FAA safety requirements, and agree to indemnify the United States government for any launch-related damages for which the United States may be responsible. DOS Approval, *supra* note 178, at 1. SSI had complied with these requirements at least two weeks before the Department of State issued its approval. See Export License Memo, *supra* note 172, at 3.

<sup>317</sup> The Department of State indicated two weeks before the launch date that an export license could not be issued before the scheduled launch date, despite SSI's explanation that all concerns of the Department had been satisfied. Export License Memo, *supra* note 172, at 3.

<sup>318</sup> See Export License Memo, *supra* note 172, at 3. Three agencies required SSI to obtain a \$100 million insurance policy, while two agencies required indemnification of the United States government and two agencies performed safety reviews. *Id.*

sarily delays completion of the application process is the FAA's use of the *Federal Register* notice procedure.<sup>319</sup> The first notice issued by the FAA with respect to SSI's launch contained little information.<sup>320</sup> A single informative notice, akin to the second notice issued in SSI's case<sup>321</sup> would be most appropriate. The FAA should publish a single notice within ten days of receiving an application and should require any comments to be submitted within twenty days.<sup>322</sup>

Finally, the use of provisional licenses would reduce the potential time concerns of private enterprise. Such an "exemption in principle" would give the private company the security of knowing that a particular launch vehicle, site, and time were approved, while retaining the flexibility necessary for the Launch Agency to adjust to last minute or unexpected developments.<sup>323</sup> This would allow the overall license procedure to operate without delaying approval until every last detail was available, and thus would promote reliable private launch schedules.

### B. Long Term Licenses

When a company establishes a permanent launch site, a one-time approval of the site should be sufficient.<sup>324</sup> The Launch Agency should restrict the necessary air space to allow the private enterprise to launch its rockets safely.<sup>325</sup> This would eliminate the need to negotiate a flight plan with the Launch Agency for each launch. In addition, when a company plans several launches using the same type of vehicle, only one review of the design and technical aspects of the rocket would be necessary. Similarly,

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<sup>319</sup> See 47 Fed. Reg. 16,243 (Apr. 15, 1982) (first notice); 47 Fed. Reg. 32,229 (July 26, 1982) (second notice).

<sup>320</sup> See 47 Fed. Reg. 16,243 (Apr. 15, 1982). See *supra* notes 144-148 and accompanying text (discussing two federal notices).

<sup>321</sup> See 47 Fed. Reg. 32,229 (July 26, 1982).

<sup>322</sup> See MISSION REPORT, *supra* note 1, at 6.

<sup>323</sup> *Id.*

<sup>324</sup> See *id.* at 7.

<sup>325</sup> The FAA has procedural rules through which it can process a private company's request for restricted air space. See 14 C.F.R. §§ 11.61 - 11.75 (1983).

when a particular type of vehicle has an outstanding track record, little review should be required.<sup>326</sup> If a space vehicle meets the safety standards established by the Launch Agency, no purpose is served by duplicating the review for each successive launch. Thus, a launch license that would be good for several flights should be available.<sup>327</sup> Of course, any deviation from the original specifications, if significant, should require additional review.<sup>328</sup> Such an approach will be increasingly necessary as the launch of private ELV's becomes routine and the cost and time required to obtain individual permits becomes too burdensome.

### C. *Foreign Launches by United States Companies*

It appears that none of the private ELV companies in the United States currently plan to launch rockets using facilities located in other countries.<sup>329</sup> Nonetheless, there certainly is potential, particularly if the United States maintains an onerous regulatory procedure, for United States companies to use foreign launch facilities or facilities located in international waters. At least one United States company, Starstruck, has designed a rocket that will launch directly from the surface of the water.<sup>330</sup> This will allow the company to launch from any point on the ocean, including locations along the equator, without having to

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<sup>326</sup> See Murdock, *supra* note 13, at 14 (FAA could certificate rockets based on history of outstanding operations).

<sup>327</sup> The DOT has already indicated that it supports the multiple launch approval approach. See Ross, *supra* note 101, at 4.

<sup>328</sup> See Ross, *supra* note 101, at 4 (deviations from plan beyond parameters of original approval require new approval). The need for further review in such a case highlights the need for the central ELV agency to ultimately possess the expertise necessary to make quick decisions with respect to important changes in the launch plan. Although the DOT suggests that it "will have available to . . . [it] every bit of expertise needed to make those decisions fairly and quickly," *id.*, such expertise will not be centrally located. Rather, to the extent that the various agencies perceive that their interests may be affected, each agency must review the changes and report back to the DOT. Information simply does not travel *between* government agencies as quickly, efficiently, and effectively as it does within a single coordinated agency that is internally controlled.

<sup>329</sup> *Commercialization Hearings*, *supra* note 3, at 202 (statement of Heiss).

<sup>330</sup> See *id.* at 231 (statement of Bennett).

use a foreign territory launch site.<sup>331</sup> Nonetheless, Starstruck has indicated that it intends to operate at all times under the jurisdiction and supervision of the United States.<sup>332</sup>

The Launch Agency must devise special procedures to respond to companies that choose to launch from points outside of United States territory. The United States treaty obligations require the government to regulate any private launches conducted by nationals of the United States.

#### D. *Payload Regulation*

One problem introduced by completely private launch services is the lack of government control over the content of the payload.<sup>333</sup> Currently, because all launches are conducted by NASA, the government knows virtually everything about each payload.<sup>334</sup> NASA has certain specifications and standards that a private payload must meet. In a system of private launches, however, the government will not have a similar institutional control over the characteristics of the payload. There exists a potential that a private company will, for the sake of profit, launch an illegitimate payload that creates national security risks. Consequently, some form of payload licensing must be devised. Certain payloads, such as remote sensing satellites, are already under the authority of the Department of Commerce.<sup>335</sup> It seems appropriate, however, for the Launch Agency itself to oversee the particular payloads that private companies place in orbit around the earth. To split the regulatory responsibility for the launch and the payload between the two agencies would create unnecessary coordination problems.

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<sup>331</sup> *Id.*

<sup>332</sup> *Id.*

<sup>333</sup> See Ross, *supra* note 101, at 5 (DOT considering payload monitoring problem).

<sup>334</sup> See *id.*

<sup>335</sup> 15 C.F.R. §§ 368-99 (1984).

### E. *Public Safety*

Of course, the Launch Agency should develop regulations, under the guidance of NASA, the FAA, the Department of State, and the other relevant agencies, to ensure that private space and launch activities will not create hazards for the public and to guarantee that launches will be adequately insured.<sup>336</sup> Although a well planned launch and launch site should not pose any significant safety hazards to the public, other users of the relevant airspace and waterways may be at risk if a rocket malfunctions or otherwise deviates from its course. Consequently, the Launch Agency should establish regulations that ensure the safety of the various aspects of a private launch from a private range.

As a general rule, such regulations should be geared toward a certain level of performance rather than definitive design requirements that restrict the innovative talents of private enterprise.<sup>337</sup> Performance standards would require the ELV companies to accomplish a particular level of success at achieving the desired objective, without regard to the method used. Design standards would require companies to employ a specific design to achieve the objective. The use of performance standards to protect the public would minimize the burden of the regulatory process on private enterprise and would avoid the technological stagnation that could result from the use of design

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<sup>336</sup> The Department of State has listed several domestic concerns that require regulation:

1. Indemnity for United States government from acts of private launch companies;
2. Ensuring safety of aircraft during launches;
3. Requiring that launch activities not interfere with communications;
4. Consideration of state environmental regulations;
5. Ensuring safety in the handling of toxic materials;
6. Assurance that the rocket will not fall apart.

Memorandum from James R. Myers to Space Services Government Regulation File, September 11, 1981.

<sup>337</sup> See Ross, *supra* note 101, at 5-6 (advocating performance standards for ELV's).



standards.<sup>338</sup>

In addition, the goal of achieving safe launches should be accomplished with the minimum regulatory burden necessary. New technologies must be evaluated carefully before commercial applications are certified, while proven designs should be usable with less scrutiny.<sup>339</sup> Moreover, the Launch Agency must balance the potential for public harm in a particular launch or group of launches with the burden that regulation will impose on the applicant. If the risk of harm is slight, due to the remoteness of the launch location, the flight path, and/or the existence of a self-destruct capability, the regulatory requirements should be minimal.<sup>340</sup> To this end, the FAA has suggested that a minimal regulatory approach, akin to the one adopted by the FAA for ultralight air vehicles,<sup>341</sup> is most appropriate for the ELV industry.<sup>342</sup> Certainly public safety is important. Nonetheless, if over-regulated, the ELV industry may be safe but non-existent.<sup>343</sup>

All of the licensing agencies appear to rely on the technical expertise of NASA to assure the safety of private rocket launches.<sup>344</sup> The Launch Agency should therefore remove the "middleman" agencies and work directly with NASA to devise the technical regulations necessary to ensure that private launch activities will be safe. The current interaction between each of the agencies and NASA is duplicative and unnecessary. However, because NASA has no direct jurisdiction over a completely private launch,<sup>345</sup> there is no other vehicle by which NASA's experience and

<sup>338</sup> See *id.* (design standards "freeze the growth of technology").

<sup>339</sup> Murdock, *supra* note 13, at 14.

<sup>340</sup> See *id.*

<sup>341</sup> See 14 C.F.R. pt. 103 (1984).

<sup>342</sup> See Murdock, *supra* note 13, at 14.

<sup>343</sup> See *id.* at 12 (questioning whether "infant industry founded by the Wright Brothers in 1903 would have been able to prosper under an extensive regulatory system").

<sup>344</sup> See Myers, *supra* note 16, at 6. See also *supra* notes 93-95 and accompanying text (regulating agencies rely on NASA's technical expertise).

<sup>345</sup> See *supra* notes 73-100 and accompanying text (discussing NASA's lack of jurisdiction).

expertise can be brought to bear on private launches. Consequently, the Launch Agency could reduce the regulatory burden on the ELV industry *and* assure public safety by establishing its own technical regulations. To avoid the high cost of acquiring all at once the technical personnel to apply these regulations, the Launch Agency should rely on NASA's personnel, as the other agencies have,<sup>346</sup> until the DOT can develop its own technical expertise.

#### F. *Launches from Governmental Facilities*

When a private company contracts to launch from the facilities of NASA<sup>347</sup> or the Department of Defense,<sup>348</sup> the Launch Agency should only marginally regulate the launch.<sup>349</sup> In such a case it is more appropriate for the relevant government entity to include in the launch agreement any restrictions necessary to ensure public safety.<sup>350</sup> The Air Force and NASA requirements for the launch of vehicles from government facilities are sufficient to protect the public, as well as ensure compliance with all international obligations of the United States.<sup>351</sup> Only if the launch service contract fails to address the appropriate safety and technical concerns should the Launch Agency assert its jurisdiction over private launches from NASA or the Department of Defense launch facilities. To this end

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<sup>346</sup> See *supra* notes 93-95 and accompanying text (regulating agencies rely on NASA's technical expertise).

<sup>347</sup> NASA will offer its launch facilities at the Kennedy Space Center for use by private launch companies. See Myers, *supra* note 16, at 6-7.

<sup>348</sup> The United States Air Force has launch facilities at White Sands, Patrick Air Force Base, Vandenberg Air Force Base, and Edwards Air Force Base. *Id.* at 10.

<sup>349</sup> See SIG REPORT, *supra* note 27, at 4 (no additional requirements or criteria beyond Department of Defense and NASA requirements or standards should be imposed on launches from national ranges).

<sup>350</sup> See *id.* (Department of Defense and NASA responsible for controlling launches from National ranges); See *supra* notes 96-100, 104 and accompanying text (NASA and Department of Defense regulate launches that use government facilities); see also Memorandum from James R. Myers to Space Services Government Regulation File, September 11, 1981 (FAA approval may not be necessary for launch from government launch facilities).

<sup>351</sup> SIG REPORT, *supra* note 27, at 4.

the President's space interagency group recommended that no "additional requirements or criteria beyond existing Department of Defense and NASA requirements or range standards should be imposed at the National Ranges unless need for such additional requirements is clearly established."<sup>352</sup>

Thus the Launch Agency should be concerned exclusively with private launch activities from private launch locations.

## VI. CONCLUSION

In less than three years, the private expendable launch vehicle business has grown from a single speculative venture to a rapidly expanding industry. So new is the industry that the government has not been able to stay abreast with the developments in the private sector, in neglect of its international treaty obligations.<sup>353</sup> The executive branch has taken important policy initiatives to promote the commercialization of space. It is now time for the executive branch to implement those policies by recognizing its authority under the Outer Space Treaty and by establishing a new Launch Agency that can grow and mature with the ELV industry.

While the approach to streamlining the existing regulatory process discussed above would go a long way toward solving the problems of private ELV launchers, many practical issues would remain. For instance, when private enterprise obtains the capability to transport people into space, a whole new approach to the regulation of rockets will be necessary. The establishment of a lead agency that will ultimately mature into a self-sustaining Launch Agency, however, would help it to develop the expertise necessary to respond to the development of a private manned space launch well in advance of its occurrence.

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<sup>352</sup> *Id.*

<sup>353</sup> The United States has an international obligation to authorize and regulate non-governmental space activities. OST, *supra* note 203, art. 6.

Perhaps the greatest single benefit to adopting a one-stop license approval process is the simplicity that it offers to those interested in performing private launch services. Private enterprise has the technology and the capital to go far in the development of space and its resources. The only remaining barrier is the confused regulatory scheme. The government should reform now, so that SSI will not be forced to determine which agencies claim an interest in a particular space vehicle launch. With sensible regulation, the private ELV industry will flourish and contribute significantly to the United States as a nation, as well as to the benefit of all mankind.

